PERSONALITIES

By George F. Taubeneck

Hail and Farewell

TOM PENDERGAST, commercial sales manager of Universal Cooler, is one fine fella—an out-and-out prince of a fella, to tell you the truth of the matter. But it's pretty hard to pin any news onto his well-tailored coat-tails, so his name doesn't appear around these parts as often as it should.

Not long ago, though, we ran a snapshot of Tom and a comely young woman on this page. They were driving a glossy team of horses, and it was remarked that Tom's consuming hobby (no pun) was horses.

Well, sir, not long after that picture was published, Tom and the young woman in the picture (the former Edythe Oesterle of Grand Rapids) up and got themselves hitched.

To us few remaining bachelors in the industry, like Salesmanager JOHN WYLLIE of Temprite, General Manager T. J. SWAN of Detroit Lubricator, and the writer, Tom's defection from the ranks was quite a blow.

But Universal Cooler men found this marriage a signal for rejoicing.

At the banquet given by Universal Cooler to GEORGE BRIGHT and his Detroit Ice Machine Co. organization last Monday night (see story on page 1 of this issue) Tom was presented with a wedding gift of silver cocktail receptacles. Also an engraved certificate—bearing the signature of everyone present at the party that night—reading:

"From Members of Universal Cooler Organization with Sincere Wishes for a Long, Happy and Prosperous Married Life. . . .'Lang may your lum reek. . .' to Mr. and Mrs. T. S. Pendergast, Detroit, October 29, 1935."

It should be noted, perhaps, that "lang may your lum reek" does not does not mean what you might think it means if you are not a Scotchman.

GORDON MUIR, advertising and publicity representative for Universal Cooler and Temprite (who got up this inscription, and who is a native Scot himself) explains "Long may your chimney smoke" is the correct translation of this Scottish phrase. So long as the chimney is smoking, so runs the belief, all is well in the home.

Mr. Pendergast, it seems, is of blood descent from the Clan Sutherland, and is entitled to wear its special plaid.

In addition to meeting old friends from Universal Cooler like Tom and Gordon, President T. S. McNEAL, LARRY EINFELDT, Chief Engineer BILL HIGHAM (*there's* a real gent for you—and me), and Treasurer C. E. COSTAIN, a red-haired Englishman from Liverpool, we talked at this party with TERRY MITCHELL, advertising manager, FRANK ZUMBRO, chief engineer, BILL AUBREY, sales manager, and D. N. BENEDICT, vice president and general manager of Frick Co.—estimable gentlemen, all.

Mitchell and Aubrey are both from the deep South, as you can tell the moment they have said three words. Our Mr. BOB NIXON, please note.

WALTER KRIEGER, Detroit Ice Machine salesman, distinguished himself at the party, and made GEORGE BRIGHT very happy, by singing a number of ballads, impromptu, with a high, rich tenor voice of the kind we used to hear before crooners came into fashion.

* * *

Why Dishwashers?

It isn't often that this department strikes a pontifical pose and delivers an if-I-were-you exhortation. But every once-in-awhile it does bother us when we stop to think how little attention is paid (comparatively speaking) to the electric dishwasher.

There, gentlemen, is an appliance which should be a *thrill* to sell. And it is a solution to the commonest, most vexatious, most irritating, and dirtiest problem in home-making.

Moreover, today's profit margins on dishwashers make it well worth the time of almost any dealer or salesman to promote and sell them.

Just to do our little bit toward this most Worthy Cause, we have obtained a summary of leading sales arguments for the electric dishwasher from an old friend, CARL SNYDER, manager of the dishwasher division of General Electric Co.

First time we ever saw Carl he was trying to sell a dishwasher to an olly-faced Cuban who was the proprietor of a somewhat rickety hotel in Havana. He was then the president of the Walker Dishwasher Co.—but still it's best and most active salesman.

Last time we saw him he was trying to sell several dishwashers to a Detroit apartment house manager. He had dropped in to visit SYD CASWELL, Detroit G-E distributor; but spent 20 minutes talking to Syd, and the rest of the day talking to prospects.

He is without a doubt the country's 10 Leading Dishwasher Salesmen.

Here are his arguments:

"Medical opinion recognizes hand dishwashing as an avenue for the transmission of disease. Investigations have proved that the electric dishwasher can check at least 66 per cent of the spread of common respiratory type diseases, such as colds and influenza.

"Doesn't it strike us as peculiar that we always have considered the tooth-brush a personal thing, that we sterilize the clinical thermometer before placing it in the child's mouth, and yet we think nothing of putting unsterilized knives, forks, and spoons in our mouths three times a day?

"But the health angle of the electric dishwasher is not its only advantage, or its only selling point. It is a time-saver, a wife-saver, and a money-saver, as well. Dishwashing is just an endless, thankless task that has to be done three times a day.

"Moreover, bending over a steaming dishpan costs more women their charm and dispositions than any other task in housework. Washing dishes in the old-fashioned way leaves hands in terrible condition.

"Then there is the breakage problem. In homes where there are maids, dishes are broken with seeming regularity during the washing process. Even if the housewife 'does her own dishes' she is apt to break a good dish or a glass every week or so.

"Count this up at the end of the year and one will find it is a tidy sum. Occasional breakage may seem an insignificant thing, but in total it really amounts to something. An electric dishwasher doesn't break dishes.

"A dishwasher also saves in hot water, in laundering of towels, in washing of greasy dishcloths, in steel wool.

"A woman's time is worth something, too. The average woman wouldn't think of working for less than 30 cents an hour—the price of unskilled labor. Yet, she may spend an hour daily washing dishes—that would be 30 cents a day, (the cost of a dishwasher on the instalment plan), day in and day out, for 365 days a year.

"Even with a maid, it costs money to be without a dishwasher, for the maid could be doing other housework while the electric dishwasher 'does the dishes.'"

* * *

As True Now As Then

For a long time this department and the editorial page of the NEWS have "laid off" what Mr. Hearst calls the Raw Deal.

Recently, though, we ran across passages from the works of two great social and political philosophers of the Nineteenth Century which are so applicable to today's situation that we are going to reproduce them herewith.

Gentlemen, from the dead past we resurrect WILLIAM GRAHAM SUMNER and HERBERT SPENCER:

* * *

'Poverty Is Best Policy'

The man who has done nothing to raise himself above poverty finds that the social doctors flock about him, bringing the capital which they have collected from the other class, and promising him the aid of the state to give him what the other had to work for. In all these schemes . . . the state is thus made to become the protector and guardian of certain classes. The agents who are to direct the state action are, of course, the reformers and philanthropists. Their schemes, therefore, may always be reduced to this type—*that A and B decide what C shall do for D* . . . In all the discussions attention is concentrated on A and B, the noble social reformers, and on D, the "poor" man.

I call C the forgotten man because I have never seen any notice taken of him in any of the discussions. When we have disposed of A, B, and D we can better appreciate the case of C, and I think we shall find that he deserves our attention for the worth of his character and the magnitude of his unmerited burdens. Here it may suffice to observe that, on the theory of the social philosophers to whom I have referred, we should get a new maxim of judicious living: Poverty is the best policy. If you get wealth, you will have to support other people; if you do not get wealth, it will be the duty of other people to support you.

It is the Forgotten Man who is threatened by every extension of the paternal theory of government. It is he who must *work* and *pay*. When, therefore, the statesmen and social philosophers sit down to think what the state can do or ought to do, they really mean to decide *what the forgotten man shall do.*

From "What Social Classes Owe to Each Other," by William Graham Sumner. Harper & Brothers, 1883.

* * *

Roosevelt May Learn

Economic relationships are so different from political relationships, and so much more complex, that no government could regulate them all.

State interference always neglects some factor of the intricate industrial situation, and has failed whenever tried.

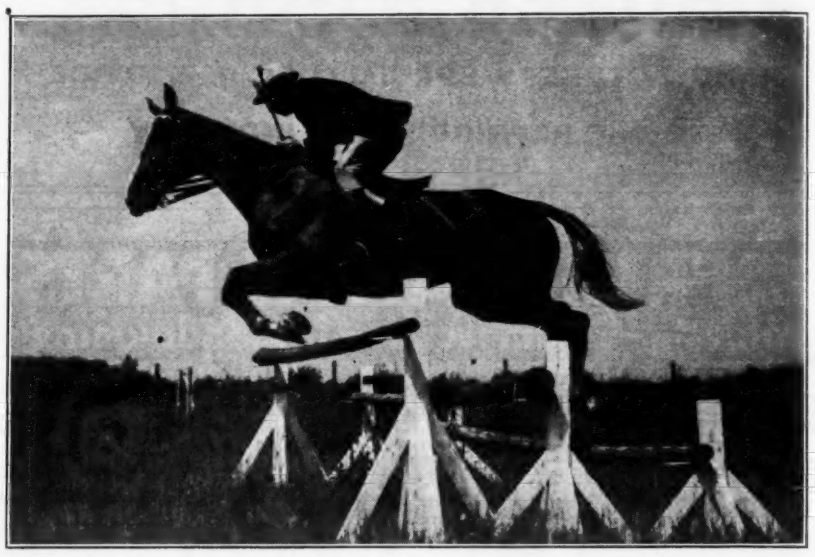
Economic relations must be left to the automatic self-adjustment (imperfect though it may be) of supply and demand.

What society most wants it will pay for most heavily; and if certain men, or certain functions, receive great rewards it is because they have taken, or have involved, exceptional risks or pains.

Men, as now constituted, will not tolerate a compulsory equality.

Until an automatically changed environment automatically changes human character, legislation enacting artificial changes will be as futile as astrology.—HERBERT SPENCER.

Tom Takes the Leap



Tom Pendergast of Universal Cooler Corp. takes one of his fine horses over the jumps at his own riding academy just north of Detroit. In the Oct. 9 issue, and in this same corner, appeared a picture of Tom taking a young woman out for a buggy ride. Shortly afterward they got "hitched."

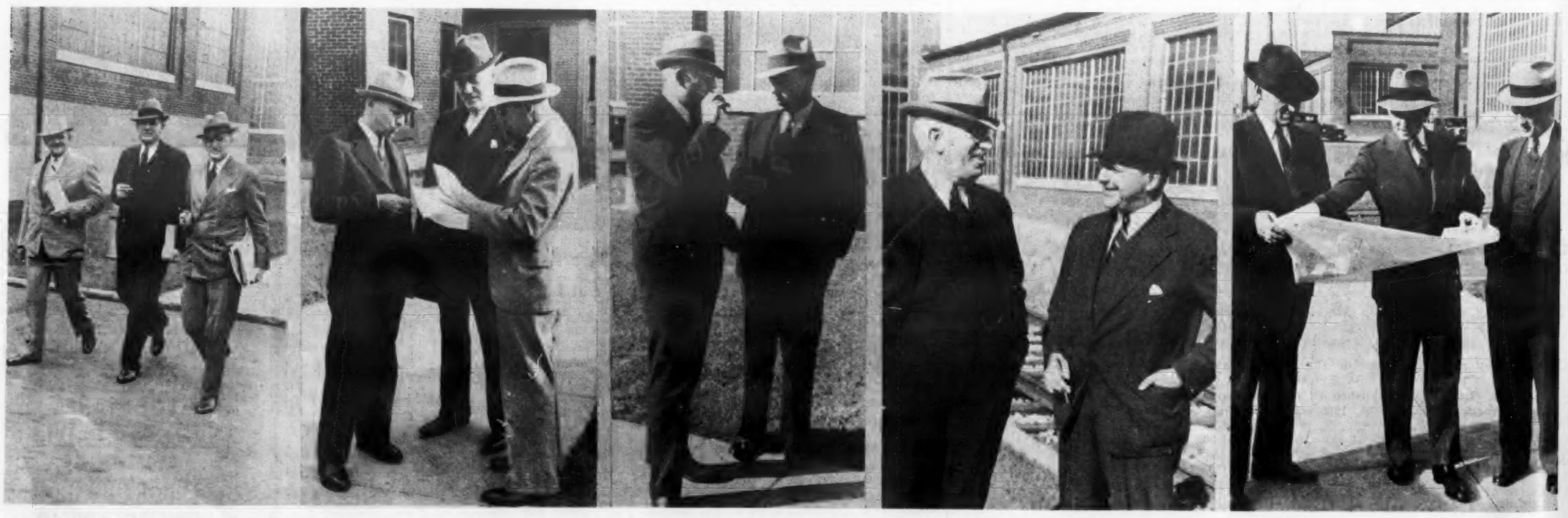
Just a Minute!

Charles D'Olive, Stewart-Warner executive, is surprised while taking a fast "constitutional."

Mr. Mahan Is a Busy Man

Sid Mahan of Westinghouse is one of the most serious-minded advertising managers in the refrigeration industry. Mr. Mahan dotes on facts and figures, and knows how to get them. The candid cameraman was unable to catch him in a leisure moment—maybe he doesn't have any—as the above pictures show.

York Calls In Its Field Organization to Work Out Plans for Air-Conditioning Sales Campaign



(1) Two Clevelanders, John Schurman, branch manager, and H.S. Yoer, sales manager, arrive with J. L. Rosenmiller, sales promotion manager, just in time for a morning session at the convention of York branch and regional sales representatives at York, Pa. (2) R. B. Meisenhelder, assistant to the general sales manager, W. E. Becker, southern regional manager, compare notes with F. A. Weisenbach, eastern regional manager. (3) S. E. Lauer, general sales manager, gets a report on Boston conditions, straight from L. S. Davis, Boston branch manager. (4) President William S. Shipley and Vice President P. H. Glatfelter enjoy a few moments respite between meetings. (5) John Hertzler (center), head of air conditioning, shows an ingenious duct layout to W. D. Hutton (left), central regional manager, and A. C. Edwards, Houston branch manager. Cameraman: Jack Schaefer.

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THE NEWSPAPER OF THE INDUSTRY

ELECTRIC REFRIGERATION NEWS

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Final Draft of Proposed Code Made in N.Y.C.

Greater Restrictions Put On Refrigerants; Use Of Solder Okayed

NEW YORK CITY—Significant changes and added provisions which would alter current installation practices mark the final revised draft of the proposed code of the City of New York relating to refrigerating systems.

The proposed code in its latest form was issued by the New York Fire Department last Thursday.

Principal changes and additions deal with restrictions on the use of refrigerants, particularly in direct expansion system; use of soldered joints; new regulations governing testing of systems; rules governing safety devices; and fees and qualifications of licensed installation and operating engineers.

Of significance is the fact that the final draft defines "non-irritant refrigerants" and "non-flammable" refrigerants in considerable detail, while the draft made public earlier in the year merely described "irritant" and "flammable" refrigerants in a sketchy manner.

Definite limits are placed on the amount of refrigerant that can be used in direct expansion systems for air conditioning in residences (with even greater restrictions where the air is being carried to sleeping rooms) and offices, while the use of direct expansion cooling systems for air-conditioning purposes is virtually barred in department stores and public buildings.

Text of the proposed New York City ordinance is published on pages 13 and 14 of this issue.

Provision is also made that where refrigerants such as Freon and Carrene are used in a room in which there is an open flame, the flame producing apparatus must be provided with a hood capable of removing the products of combustion to the open air.

Installation and servicing of all refrigeration equipment can be done only by persons licensed by the Board of Examiners, which means that they must pass a test before the board, and pay an annual fee of $100.

No refrigerating system containing more than 100 lbs. of refrigerant can be operated in any building except under the personal supervision of either a licensed engineer or a person who has obtained a certificate of qualification to operate such a system.

Soldered joints are permitted in tubing up to 2⅛ in. O.D., and flared joints in tubing up to ⅞ in. O.D. Melting point for solder used in joints must be not less than 400° F., where in previous drafts it had been set at 1300° F.

Specific restrictions are placed on the type of fittings which may be used.

In the section on "safety devices" a new sentence has been added which states that "A fusible plug will not be accepted in lieu of a spring loaded pressure relief valve where such valves are required."

With respect to testing, the proposed code calls for tests on the premises where the system is to be operated, and bars the use of oxygen for test purposes.

A number of provisions have been added which set up regulations for the construction of duct work and fresh air intakes on air-conditioning systems.

Campbell Will Supervise Hussmann Sales

ST. LOUIS—New general sales manager for Allied Store Utilities Co. here, manufacturer of Hussmann-Ligonier display cases and commercial cabinets, is Austin C. Campbell, who will take over the sales supervision duties formerly handled by W. B. McMillan, president of the organization.

Four regional sales managers have also been appointed as follows: W. J. Stelpflug, central sales manager; A. B. Biddle, western sales manager; Jack Baldwin, special representative; and A. Virach, special sales supervisor.

T. K. Quinn Resigns to Become Head of Maxon Agency; C. E. Wilson Will Direct G-E Appliance Activities

C. E. WILSON

T. K. QUINN

SCHENECTADY—T. K. Quinn, vice president of General Electric Co. and chairman of the company's specialty appliance sales committee, has resigned to become president of Maxon, Inc., advertising organization of Detroit, Cleveland, and New York City.

Mr. Quinn will take over his new position on Jan. 1. Replacing him in the General Electric organization is Charles E. Wilson, vice president in charge of G-E's merchandise department, who has been assigned responsibility for the direction of all appliance activities of the company.

Coming to General Electric in 1911 as a clerk in the shipping and billing department of the National Lamp Works in Cleveland, Mr. Quinn worked up through the credit and sales departments to become manager of miniature lamp sales in 1922, general manager of the incandescent lamp department in 1927.

In 1930, he was elected a vice president, retaining general charge of the refrigeration department, and becoming chairman of the appliance sales committee, which position he held until his resignation.

General Electric has made a retainer arrangement with Mr. Quinn, whereby he will assist Mr. Wilson and any other part of the company in connection with any questions of public relations and sales promotion, in addition to his advertising work.

"After 24 years, this change would be difficult, indeed, except for the arrangement which permits me to continue my connection with the General Electric Co.," Mr. Quinn said, following the announcement of his resignation last week by President Gerard Swope.

Mr. Wilson, a native New Yorker, started his career in the electrical field as office boy with the Sprague Electric Co. Later he served as shipping clerk, factory accountant, and porcelain manager. Later, he became assistant superintendent and sales manager of the company.

He came to General Electric when the company acquired conduit business at New Kensington, Pa., in 1917, and the following year was appointed general superintendent of the Maspeth, L. I., and New Kensington works. In 1923, Mr. Wilson was transferred to Bridgeport, Conn., to become managing engineer in charge of conduit and wire, and in 1925 he was appointed assistant manager of the Bridgeport works.

In June, 1928, he became assistant to Vice President C. E. Patterson of the merchandising department, and in January, 1930, was appointed manager of the department in charge of engineering, manufacturing, and sales. In December of the same year, he was made a vice president and a member of the newly-formed appliance sales committee of the company.

In his new position, Mr. Wilson will divide his time between the Bridgeport and New York City offices of G-E, and will be principally concerned with radios and merchandising products at Bridgeport, refrigerators, ranges, and specialty appliances at Cleveland, and air-conditioning apparatus at Bloomfield, N. J.

F-M Names Peltier Chief Engineer

CHICAGO—Frank D. Peltier has been appointed chief engineer of the refrigeration division of Fairbanks-Morse Home Appliances, Inc., states W. Paul Jones, vice president of the company.

Mr. Peltier was for over seven years with Servel, Inc., in its engineering and its production departments.

A graduate of Brooklyn Polytechnic Institute, Mr. Peltier has done refrigeration research and engineering work for New York Edison Co., Electric Refrigerator Co., and Holmes Refrigerator Co.

At Servel, Inc., he was research engineer, assistant chief engineer, and assistant to the vice president in charge of production. Patents covering some of the fundamental developments of electric refrigeration obtained by Mr. Peltier include: original design or improvements on evaporators, compressor valves, compressors, oil returns, and liquid refrigerant control.

A-P Markets New Line Of Expansion Valves

MILWAUKEE—A new series of thermostatic expansion valves, built to meet the needs of air conditioning and small and medium sized commercial refrigeration, and covering a range of sizes up to 15 tons capacity, has just been introduced by Automatic Products Co. here.

Outstanding feature of the valves is the fact that the valve body itself can be placed in an ambient temperature higher or lower than the bulb temperature. This is said to greatly simplify installation problems. In addition, the bulb can be installed in any position on the suction line.

In operation, as the pressure differential between the power element and evaporator inlet increases, the diaphragm forces the needle valve open. Reduction of pressure reduces the valve opening.

Diaphragm construction is employed, permitting the use of a liquid filled power element, which follows the suction gas temperature with speed and accuracy.

The power element is so charged that, at low superheat settings, the superheat increases with rising evaporator pressures, reducing compressor motor loads at abnormally high evaporator pressures. Abnormally high superheat occurs only at abnormally high evaporator pressures, and permits closer sizing of evaporator coils to load requirements.

Model 210, smallest valve in the line, is limited in application, by its size, to commercial refrigeration and small air-conditioning installations. It can be had for Freon, methyl chloride, or sulphur dioxide systems, up to 2 tons capacity.

This unit, as well as other valves in the series, has the forged brass construction.

Movement of this diaphragm opens and closes the valve needle, made of stellite, and accurately ground to insure a perfect shut-off against its

(*Concluded on Page 14, Column 3*)

Hertzler Will Manage Air-Conditioning Dept. of York

YORK, Pa.—John A. Hertzler has been appointed manager of the air-conditioning division of York Ice Machinery Corp. here. Mr. Hertzler joined the York organization in 1927, completed a two-year engineering course given by the company, and entered the air-conditioning division at York.

In 1930 he transferred to the air-conditioning sales division at Brooklyn, where he eventually became head of air-conditioning sales in that territory.

Engineers Complete Convention Plans

NEW YORK CITY—Air conditioning will hold the spotlight of interest at the thirty-first annual convention of the American Society of Refrigerating Engineers in Hotel Pennsylvania here Dec. 4, 5, and 6, the complete technical program of the meeting, just issued, reveals.

Speakers at the A.S.R.E. business sessions will include some of the leading figures in the air-conditioning industry.

Another high spot of the meeting will be the engineers' debate, in which students from Stevens Institute and Polytechnic Institute of Brooklyn will discuss the question: "Shall engineering be made a closed profession?"

The welcome luncheon, on Dec. 4, has as its featured speaker William Fellowes Morgan, Jr., commissioner of markets of New York City.

High spot on the entertainment program will be the annual dinner dance, to be held on the Pennsylvania's roof garden on the night of Dec. 5.

Wives of engineers attending the convention will be entertained at a luncheon, bridge, and style show in the hotel on Dec. 4, a tour through the Museum of Modern Art, and matinee parties preceding the dinner dance.

Committee in charge of the entertainment program is as follows:

C. F. Holske, chairman; Paul Staples, L. G. Seebach, L. H. Roller, Crosby Field, Ira MacFarland, E. C. Soares, James Larkin, R. C. Waterfill, H. C. Guild, J. E. Fitzsimmons, and C. E. Neeson.

On the women's entertainment committee are Mrs. Harry Harrison, chairman; Mrs. A. H. Baer, Mrs. George

(*Concluded on Page 2, Column 1*)

7,500 Refrigerators Sold In Miami Area

MIAMI, Fla.—More than 7,500 electric refrigerators have been sold to date this year by approximately 50 dealers in this territory, exceeding by 100 per cent the total for the same period last year, figures of a recently conducted survey show. About 200 electric ranges and water heaters have also been sold so far this year.

Standard Test Methods For Condensing Units In This Issue

Published on pages 10 and 11 of this issue is the second half of the complete text of the "Standard Methods for Testing Mechanical Condensing Units," recently approved by the Refrigeration Division of National Electrical Manufacturers Association, and the Refrigerating Machinery Association. The first part of these standard test methods were published in last week's issue (Nov. 6).

In the issues of Nov. 20 and Nov. 27 will be published the "Standard Methods for Rating and Testing Air Conditioning Equipment," which have also been approved by the associations mentioned above. These standards represent a pioneer step in the air-conditioning field, and are of value to manufacturers, dealers, and prospective users.

Extra copies of these issues are available at 10 cents each. In ordering extra copies be sure to enclose remittance.

Detroit Dealers Draw Up Code Of Trade Ethics

Association Plans Code to 'Clean Up' Appliance Sales Practices

By Phil B. Redeker

DETROIT—Better Retailers Appliance League of Detroit meeting last Wednesday drew up a seven-point code of ethics designed to "clean up" appliance merchandising practices in the metropolitan area, and heard a representative of the local credit bankers who handle electrical appliance time paper sound a warning that some of the type of deals that have been consummated recently will not be tolerated.

The code of ethics drawn up at the meeting is as follows:

No. 1 Selling Commissions

When advertising for salesmen, rate of commission not to be advertised or any phraseology used, such as: "Highest rate of commission in city," or "Higher commissions than any other competitor is paying," or "Amount of salesmen's earnings," etc.

No. 2 Retail Selling

No wholesaler or jobber shall sell to retail trade except through retail operations set up to handle this in their regular course of business. Should any such sales be made, Michigan sales tax paid thereon must be reported to the office of the League.

No. 3 Consignments

There shall be no consignment of merchandise for samples or otherwise whatsoever, either by distributor, jobber, or dealer.

No. 4 Authorized Dealers

The definition of an authorized dealer is that he must have a store, and maintain representative display of merchandise which he sells, and

(*Concluded on Page 2, Column 3*)

Nelson Made Asst. Sales Manager of Universal Cooler

DETROIT—Apponitment of Richard G. Nelson as assistant domestic sales manager of Universal Cooler Corp. has been announced by Frank S. McNeal, president.

Mr. Nelson, who has already assumed his new duties, began his refrigeration career with Frigidaire Corp. He went from there to the engineering division of Westinghouse Electric & Mfg. Co.

Following this he became successively, contract department manager, district sales manager in the southeast territory, and assistant sales manager of Leonard Refrigerator Co.

Hotpoint Will Select 8 Division Managers

CLEVELAND—Hotpoint Refrigerator division of General Electric Co., will soon appoint eight district representatives to assist the sales organization, reports Harry C. Mealey, division manager.

Territory assignments will be made around the first of the year. Headquarters will be in New York City, Philadelphia, Atlanta, Cleveland, Chicago, Kansas City, Dallas, and San Francisco. Representatives will work with Hotpoint refrigerator distributors and jobbers in the appointment of new dealers and in promoting sales.

"August sales of Hotpoint refrigerators were almost three times those for the same month of last year; and our September sales were approximately two times the sales in September of 1934," states Mr. Mealey.

Hussmann Distributing Co. To Sell Lipman Units

DALLAS—The Hussmann Distributing Co. of this city has been appointed distributor of Lipman refrigeration equipment in this territory by the General Refrigeration Sales Co., Beloit, Wis. The new distributorship is under the management of Sol Archer, who has sold Lipman equipment for a number of years in this vicinity.

Program Completed For A.S.R.E. Meet

(Concluded from Page 1, Column 3)

Hulse, Mrs. C. F. Holske, Mrs. David L. Fiske, Mrs. H. C. Guild, and Miss Helen Peffer.

The complete program for the meeting follows:

Wednesday, Dec. 4, 10 a. m. FIRST SESSION (Salle Moderne, on roof). Topic: Technical Aspects of Air Conditioning. Chairman: N. H. Hiller, past president, ASRE. Introduction by President Harry Harrison.

"Data from Experiment & Research Preceding the Construction of Large Freon Compressors," Llewellyn Williams, engineer in chief, York Ice Machinery Corp., York Pa.

"Rational Application Procedure in Selecting Air-Conditioning Equipment," F. H. Faust and F. D. Urban, General Electric Co., Schenectady.

"Fan Selection and Nomenclature," A. A. Berestneff, research engineer, Carrier Engineering Corp., Newark.

12:30 p. m. Welcome Luncheon (Club Rooms, on roof). Speaker—William Fellowes Morgan, Jr.

2:30 p. m. SECOND SESSION. Topic: General Aspects of Air Conditioning. Chairman: Dr. A. R. Stevenson, past president, ASRE.

"Investigations of the Health Aspect of Air Conditioning," Dr. W. J. McConnell, industrial health section, Metropolitan Life Insurance Co., New York City.

"The Control of Odors," Philip Drinker, Harvard School of Public Health, Boston.

"Safety in Air Conditioning," Dr. C. S. Cragoe, senior physicist, Bureau of Standards, Washington, D. C.

Sound Film—"Industrial Noise Control" with annotations by Harold R. Berlin, Johns-Manville, New York City.

8:30 p. m. Engineers' Debate (to be broadcast). (Salle Moderne). Question: "Resolved, that Engineering should be a closed profession." Contestants to be students of the Stevens Institute and the Polytechnic Institute of Brooklyn. ($300 in prizes).

10:30 p. m. Night Club Expedition.

Thursday, Dec. 5, 10 a. m. THIRD SESSION. (Salle Moderne). Topic: Commercial Practice. Chairman: H. M. Williams, vice president, ASRE.

"Passenger Car Cooling Methods," Kenneth Cartwright, engineer, N.Y. N.H. & H. Ry., New Haven, Conn.

"Truck Refrigeration for Perishables," George Lange, vice president, American Ice Co., New York City.

"Factors in Farm and Community Refrigeration," W. R. Woolrich, R. B. Taylor, and Mack Tucker, University of Tennessee, Knoxville, Tenn.

"SO_2 Film Heat Characteristics in a Vertical Evaporator Pipe," Profs. F. S. Hechler and F. C. Stewart, Pennsylvania State College.

12:30 p. m. Council Luncheon (Conference Room).

2:30 p. m. FOURTH SESSION. Topic: Applications of Air Conditioning. Chairman: Harry D. Edwards, past president, ASRE.

"Specifications for Air Conditioninf," E. W. Goodwin, senior mechanical engineer, procurement division, Treasury Dept., Washington, D. C.

"Air Conditioner Testing and Rating Methods," (Proposed Standards for Rating and Testing Air-Conditioning Equipment), Glenn Muffly (for Joint Committee).

"Pipe Line Air Conditioning," Nels H. Rosberg, manager of production, California Consumers' Co., Los Angeles.

"New Installation in Gimbel-Saks Stores," description by C. S. Leopold, consulting engineer, Philadelphia, followed by inspection tour.

Friday, Dec. 6, 10 a. m. FIFTH SESSION. Chairman: Mr. Harrison.

"The Rate of Cooling of Fruits and Vegetables in Storage and Transit," D. H. Rose, senior physiologist, Bureau of Plant Industry, Dept. of Agriculture, Washington, D. C.

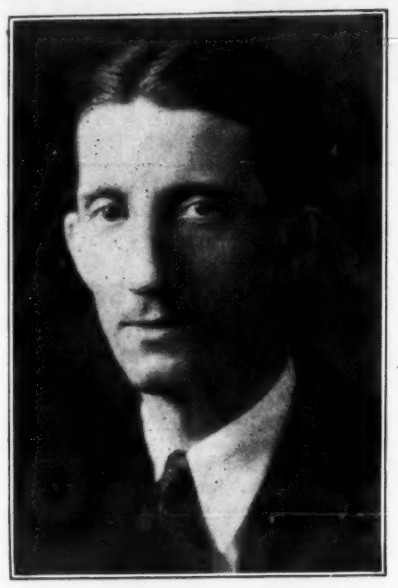
"Proposed Standards for Rating and Testing Mechanical Condensing Units," L. S. Morse (for Joint Committee).

"Winery Refrigeration," R. M. Armstrong, Richmond, Va., Ice Co.

"Eutectic Salt Ice," Crosby Field and Arthur Adams, Flakice Corp., Brooklyn, N. Y.

2 p. m. Inspection trip to Hayden Planetarium, including inspection of air cooling machinery.

Directs Sales



ELMER BORN
Sales manager of Portable Elevator Co., manufacturer of a new combination beverage and food cooler.

FHA Accepts Mortgages Valued at $810,300 in N. J. During August

WASHINGTON, D. C.—Mortgages accepted for insurance by the New Jersey offices of the Federal Housing Administration during August totaled $810,300, 64 per cent of the $1,266,000 in building permits recorded during the month for 1 and 2-family dwellings in cities over 10,000 population, reports Stewart McDonald, FHA administrator.

Since the single mortgage system went into effect in the state last February, FHA insuring offices have made commitments for insurance covering 51.82 per cent of the amount of new construction indicated for New Jersey by building permits issued for 1 and 2-family dwellings, Mr. McDonald said. This figure, moreover, does not include cities under 10,000 population.

As estimated by the Bureau of Labor Statistics, value of 1 and 2-family dwellings for which permits were issued from February to August, 1935, totaled $6,916,900. For the same period, mortgages accepted for insurance on new construction by New Jersey FHA offices was $3,584,700.

Selling Code Drafted By Detroit Dealers

(Concluded from Page 1, Column 5)

be equipped to render efficient service.

No. 5 Misleading Advertising

All merchandise sold is to carry standard service guarantee, and it is recommended that all members observe manufacturers' suggested retail installed cash price on current models, with prevailing carrying charge rates added. Misleading advertising prohibited.

No. 6 Premiums

Premium advertising is allowed only if offered to all dealers alike by distributor or manufacturer. No other premiums to be offered.

No. 7 Sunday Closing

Members are to keep their stores closed on Sunday.

The League claims that a majority of the local dealers are now numbered among its members, and that most of the distributors in this territory have expressed their approval of the League's activities.

Local credit bankers have endorsed the League, and will back it in the enforcement of the code of ethics, declares Frank J. Gleason, the League's secretary.

W. H. Bovee of First Bancredit Corp., speaking for his firm and for Commonwealth Commercial Bank, Detroit Savings Bank, and the Industrial Morris Plan Bank, told the dealers that the convenient terms made possible by the FHA modernization loan plan were resulting in too much "off-color" paper, and that unless the retailers themselves took steps to tighten credit extensions, the banks themselves would be forced to take action.

Appointed at the meeting were a "dealer-dealer" grievance committee, chairmaned by S. Lind; and a "dealer-distributor" committee, headed by Frank Hackett. Other members of the committees will be named by the chairman.

It was also decided that the membership committee of the League which will pass upon applications for membership shall be any quorum of the board of directors. (See Oct. 30 ELECTRIC REFRIGERATION NEWS for names of board members.)

The code will take effect Nov. 15, and is subject to amendment. Violations will be reported to Mr. Gleason.

Membership fee to the League was set at $40 annually, payable quarterly in advance.

San Diego Dealers Plan Xmas Appliance Exhibition

SAN DIEGO, Calif.—A Christmas electrical show, the third annual electrical exposition sponsored by the Bureau of Radio and Electrical Appliances of San Diego County, will be held here Dec. 4 through Dec. 8, reports J. Clark Chamberiain, secretary-treasurer of the bureau.

Mr. Chamberlain believes that the Christmas show, built around the theme "electrical gifts keep on giving," will prove a great sales stimulus.

"So-called heavy appliances have never really sold at Christmas time," he declares. "Not only will such sales be stimulated now, but the carryover will keep things booming through January and February. We know by experience that people who will not inspect appliances in a dealer's store will do so at a show."

Utility Management Plans Campaigns For Holidays

NEW YORK CITY—A "Holiday Circus," to capture the interest of the public during its yearly "buying spree," will feature the Christmas sales production activity of Utility Management Corp., through its various properties in the United States and Canada.

This three-ring electric and gas event, built around electric refrigerators, ranges, and water heaters, will be held from Nov. 18 to Dec. 21, inclusive.

Quota for this year's campaign is addition of 2,740,800 k.w.h., or 49,800,000 cu. ft., to the utility's power lines. This is double last year's record, in which 1,668 electric refrigerators, 99 gas refrigerators, 344 electric and 1,577 gas ranges, and 52 electric and 442 gas water heaters were sold.

Thanksgiving Promotion Theme

"Ballyhoo Turkey Talk to electric and gas prospects," is the circus call for November. Distributors and dealers will preface the campaign with a general sales meeting, held in the home office (which is to be decorated with circus banners). To this meeting division superintendents, sales supervisors, dealers, and home economists will be invited. The outline for the meeting's procedure is given.

For the Thanksgiving promotion the plan is to "make the public want its Thanksgiving turkey cooled automatically and cooked automatically, and its dishes washed automatically."

During the week of Nov. 18 to 23, the campaign will open with newspaper advertising, publicity, holiday window displays, demonstrations, and direct mail advertising. To the prospects who haven't bought because they "can't afford it," circus leaders will "talk turkey."

Getting floor traffic by Thanksgiving home service sales demonstrations is part of the plan. Menus for inexpensive holiday dinners for a family of four, a moderate price suggestion for a holiday party for six or 24 are provided.

Plans for Second Week

Suggestions for the second week of November include:

1. Supply salesmen and employees who now own a modern gas or electric range with spade-shaped turkey feathers to wear in coat lapels, to signify that they belong to the "Fraternity of Electric or Gas cookery load builders."

2. Place a live turkey in the window on Monday, and announce that it will be roasted in the automatic electric or gas range on Friday, and that it will be given to the person who guesses nearest to its weight when it is removed from the oven.

3. Offer employees turkeys for tips on prospects.

4. Get a local butcher to put a Thanksgiving display in your window with a roasted turkey, range, and electric refrigerator predominating this display.

5. Hold night sales meetings lasting 15 minutes, to encourage night calls. Have a dinner for the salesmen one night a week, and see that they start off promptly at 6:30 to make evening calls.

Newspaper advertising, new direct mail pieces, all built around the slogan "What mother really wants," are starters in the Christmas circus cycle. "Emphasize the gift idea by having featured articles wrapped in cellophane and tied with ribbon," is the next step.

Turkey-Bean Dinner

To get the Christmas selling spirit into the sales crew, dealers will divide salesmen into two groups and have a contest ending in a turkey-bean dinner—turkey to the high men, beans to the low.

A Christmas Tree contest will involve the placing of small Christmas trees in spots where salesmen congregate, or in various departments in the store. Tags designating the progress of each salesman will adorn the branches. Prizes of merchandise will be awarded to winners when the contest closes.

Working all possible prospects, using telephone canvassing, home service departments, tie-ins, and general canvassing of business prospects will occupy the days right before Christmas.

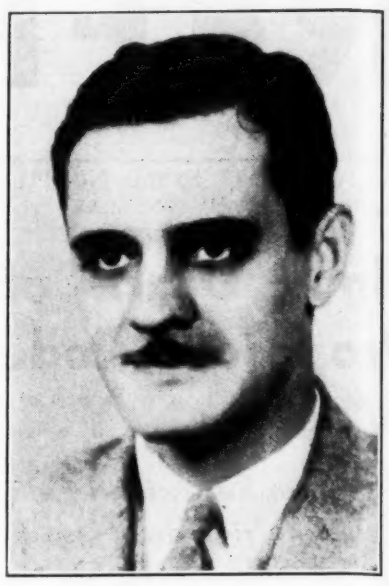
While "show men" will devote most of their attention to shouting the merits of the three-ring features—refrigerators, washers, and ranges (and to the side show, dish-washers), "barkers" will also stress the electric kitchen as a Christmas gife. Use of the New American Home, in locations where one is installed, is advocated.

Finance charge on models in this Christmas drive is one-half of one per cent a month on the unpaid balance. Sales can be made on the FHA finance plan.

Special compensation for salesmen to encourage selling for cash, financing under the FHA, or a reduction in terms to 12 months where the time payment chart calls for 18 months or more, are: Cash or FHA financing; refrigerators, $2; ranges, $2.50; water heaters, $2.50; combination electric water heaters and ranges, $5; 12-month terms: refrigerators, $1; ranges, $1.25; water heaters, $1.25; combination electric water heaters and ranges, $2.50.

A $1 bonus for obtaining a $25 or higher down payment on any single unit sale, and a $2 bonus for paying $50 or a higher down payment on any of the combination sales, are also part of the compensation plan.

With Universal Cooler



R. G. NELSON
Assistant domestic sales manager of Universal Cooler Corp.

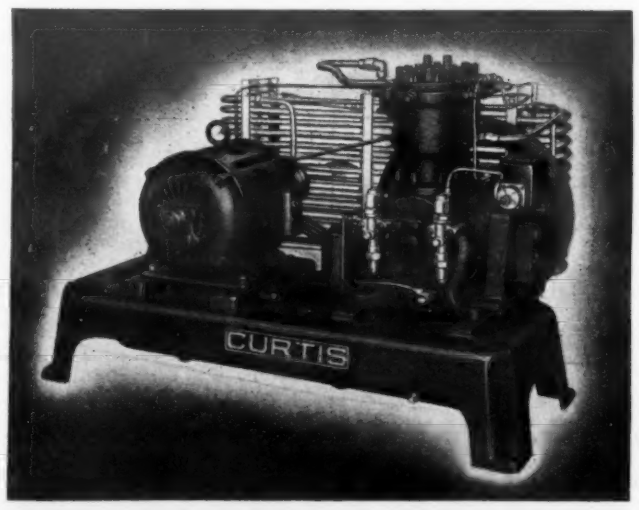
G-E Range Dept. Running On Full-Time Schedule

CLEVELAND—General Electric factories engaged in the manufacture of electric range equipment are running on a full-time schedule, this being the first year in the history of electric range manufacture that a constant production schedule has been maintained from the beginning of the year, declares J. R. Poteat, manager of the company's electric range division.

"More people are engaged in our factories than at any time in our history," Mr. Poteat states.

CURTIS REFRIGERATION
Units to fit every need

Curtis, one of the oldest compressor manufacturers, offers an unusually complete line of refrigerating units—⅛ to 2 H. P. air cooled; ⅓ to 15 H. P. water cooled—reflecting 81 years of successful engineering, designing and manufacturing experience. Some desirable territories are still open for reliable distributors.

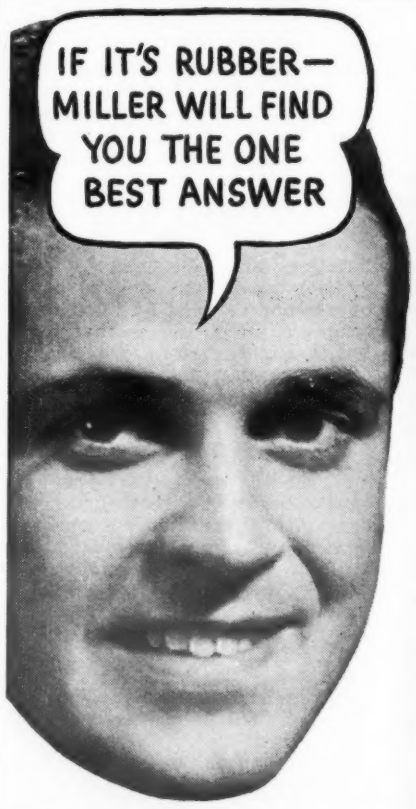


81 SUCCESSFUL YEARS ESTABLISHED 1854

Write for details.

CURTIS

CURTIS REFRIGERATING MACHINE CO.
Division of Curtis Manufacturing Co.
1912 Kienlen Avenue, St. Louis, U. S. A.



Special Service on
SPONGE
RUBBER PARTS

TEN years of close cooperation have made Miller's technical staff part of the electric refrigeration industry. We know your problems. We have helped solve many of them. Sponge rubber, for instance. Improvements developed by Miller are performing valuable service for leading manufacturers, in new uses of sponge rubber. Our consulting service is yours for the asking. Just write Miller Rubber Products Co., Inc., Akron, Ohio.

OUR EXPERIENCE WILL SAVE YOU TIME AND MONEY

Miller

5 Rural Electrical Projects Approved

WASHINGTON, D. C.—Morris L. Cooke, administrator of Rural Electrification Administration, last week gave final approval to seven rural electrification projects to serve more than 4,000 farm homes which, with a few exceptions, have never known the benefits of electricity.

Seven contracts for REA loans for these projects, signed by Mr. Cooke, provide for the construction of 1,125 miles of new rural electric distribution lines in territory now without service.

The lines will be built in Boone County, Indiana; Rhea County, Tennessee; Miami County, Ohio; Bell County, Texas; Dallas County, Iowa; and Scott's Bluff County, Nebraska. For Scott's Bluff County there are two projects.

The loan contracts are between REA and organizations of various types which sponsor the projects. Before Mr. Cooke affixed his signature to them they had been signed by representatives of these sponsoring organizations.

Loans made by REA, aggregating $1,274,084, represent the entire estimated cost of building the lines. They call for 3 per cent interest and repayment over a period of 20 years. No repayments of principal will be required during the first year. For security REA will take mortgages on the lines, except in Dallas County, Iowa, where the private utility undertaking the construction pledges its general credit.

In order that the farms served may obtain the fullest advantages of electric service, and to promote a freer use of electricity which should assure adequate revenue for each project, additional loans will be made available for house wiring, electrical appliances, and electrical farm equipment.

These loans will be made in the main by the Electric Home & Farm Authority. They will finance the purchase, through dealers, private utilities, or other non-Federal agencies, of such equipment as electric refrigerators, water heaters, washing machines, ranges, and utility motors.

Utility Dispels Suspicions On Small Machines by Keeping Them Running

GREELEY, Colo.—That most people are suspicious of small, low-priced electric refrigerators, is the belief of the management of the Greeley Light & Power Co., so this firm keeps one of these appliances on display and in operation at all times to demonstrate that such suspicions are unwarranted.

The store has often found that many prospects, who cannot afford to buy anything larger than a low-priced refrigerator, are wary of the small appliance and have the wrong idea that they do not give the best service.

This public "complex" has been successfully overcome by operating one of these appliances during the entire time it is on display. Ice cubes are frozen and the refrigerator operated almost as if it were in a private home.

Blair & Frailey to Speak At Chicago Meeting

CHICAGO—Milton J. Blair, vice president of J. Walter Thompson Co., and L. E. Frailey, editorial director of Dartnell Corp., Chicago, will be featured speakers at the two noonday meetings Nov. 21 and 22, to be held at Hotel Sherman by the Purchasing Agents Association of Chicago in connection with its annual Members and Advertisers Products Exposition.

Mr. Blair will discuss "Values of Advertising" at the Nov. 21 meeting, and Mr. Frailey will speak on "The Forgotten Salesman" the next day.

The exposition will be closed with a banquet in the Sherman's Grand Ballroom on Nov. 21. Entertainment will be by George Olsen and his music, and Ethel Shutta.

Labor Saving Kitchens Are Planned for 30 New Homes

NEWARK—Labor saving kitchens planned for the 30 model homes being built here by Fred Holt, contractor, will contain Crosley electric refrigerators, installed by the Apollo Distributing Co., here.

Newark Dealer Moves To Larger Store

NEWARK — Rosseter's, electrical home-furnishing department store here, has moved to new and larger showrooms at 61 Washington St. here. Former location of this concern was 14 Hill St. E. M. Bacharach is general manager of Rosseter's.

Chief Engineer

FRANK D. PELTIER
New chief refrigeration engineer for Fairbanks-Morse.

Household Appliance Sales Are Better Than in 1934

NEW YORK CITY—Sales in many divsions of the household products field have recorded unusual gains in recent months, and indications now are that volumes for the year as a whole will be the best since pre-depression periods, says the current "Household Products and Supplies" issue of *Standard Trade and Securities*, a publication of Standard Statistics Co.

As a group, household products manufacturers are expected to report moderately improved results for 1935, as compared with 1934, and a marked extension of the upward trend is expected for 1936, the survey predicts.

While continued improvement in public buying power has been primarily responsible for the marked betterment, the bulletin states, efforts of the FHA and other governmental agencies to promote demand for semi-luxury products through the creation of credit facilities have played a contributing part.

Manufacturers have done much to stimulate buying interest by more aggressive promotional campaigns, and the active response of retailers to these programs has been prompted not only by the anticipation of higher prices, but also by inventory needs arising from a sharp upturn in retail sales.

The temporary setback suffered by certain lines during the late spring and early summer, the publication says, due to cool weather, has been more than made up by a considerably higher than seasonal level of sales. The delayed upturn in sales, moreover, has largely eliminated the earlier threat of price cutting and inventory losses, since surplus stocks have been depleted, and dealer inventories are now low.

In the household refrigeration field, the survey says, postponed seasonal demand is reflected in the unit sales of models for August, which set a new high record for the month, and brought the eight-months total to 1,465,700 units, more than the number sold in all of 1934, the previous high year.

"Although demand will taper off over coming months, sales are expected to remain at higher than seasonal levels, and, with dealer stocks low, the price structure should remain firm," the bulletin says.

Despite high summer temperatures and the more aggressive bid made for business by ice producers through materially improved ice boxes, the poor results earlier in the year will hold 1935 earnings well below 1934 levels, it is predicted.

In its section on "Outlook for Household Products Stocks," the bulletin discusses three companies in the mechanical refrigeration field: Kelvinator, Servel, and Armstrong Cork Co.; and two ice companies: American Ice Co., and City Ice & Fuel.

Of Kelvinator, the publication states:

"It is undestood that operations for the September quarter were the best for any similar period in the company's history. Thus, while earnings for the first nine months (ended June 30, 1935) of the fiscal year declined to 68 cents a share from $1.09 in the like 1933-34 interval, profits for the full period are placed at 90 cents a share."

Discussing Servel:

"The placing of the stock on an indicated 50 cents annual dividend basis was in line with the recent marked earnings betterment. Profits for the first nine months ended July 31 amounted to $1 a share, compared with 32 cents a share in the corresponding period last year. Earnings for the full fiscal year now ending are estimated at $1.05 a share, against 27 cents a share last year. The usual seasonal slackening of business probably has been experienced during the current quarter."

Armstrong Cork Co.:

"The moderate earnings betterment registered in the first half of 1935 (when net advanced to $1.26 a share from $1.16 in the comparable 1934 period) should be extended over the final six months, since demand for the company's products will be stimulated by the prospective further improvement in general business, as well as a higher than seasonal level of residential building activity. Indications are that full year profits will approximate $2.75 a share."

American Ice Co.:

"While high summer temperatures stimulated sales, the company has now entered the dull season of the year, and operations are likely to be conducted at a loss over coming months. Since $1.74 a preferred and a deficit of 69 cents a common share was shown for the first nine months, earnings for the full year are likely to fall below the $3.25 per preferred share earned in 1934."

City Ice & Fuel:

"Although the company's business responded to seasonal factors during the summer, the disappointing results earlier in the year held profits for the first nine months to $1.41 a common share, against $2.57 for the corresponding 1934 period. It is likely that full year 1935 earnings will be less than the present annual $2 dividend rate."

Pocock Will Distribute Stromberg-Carlson Line

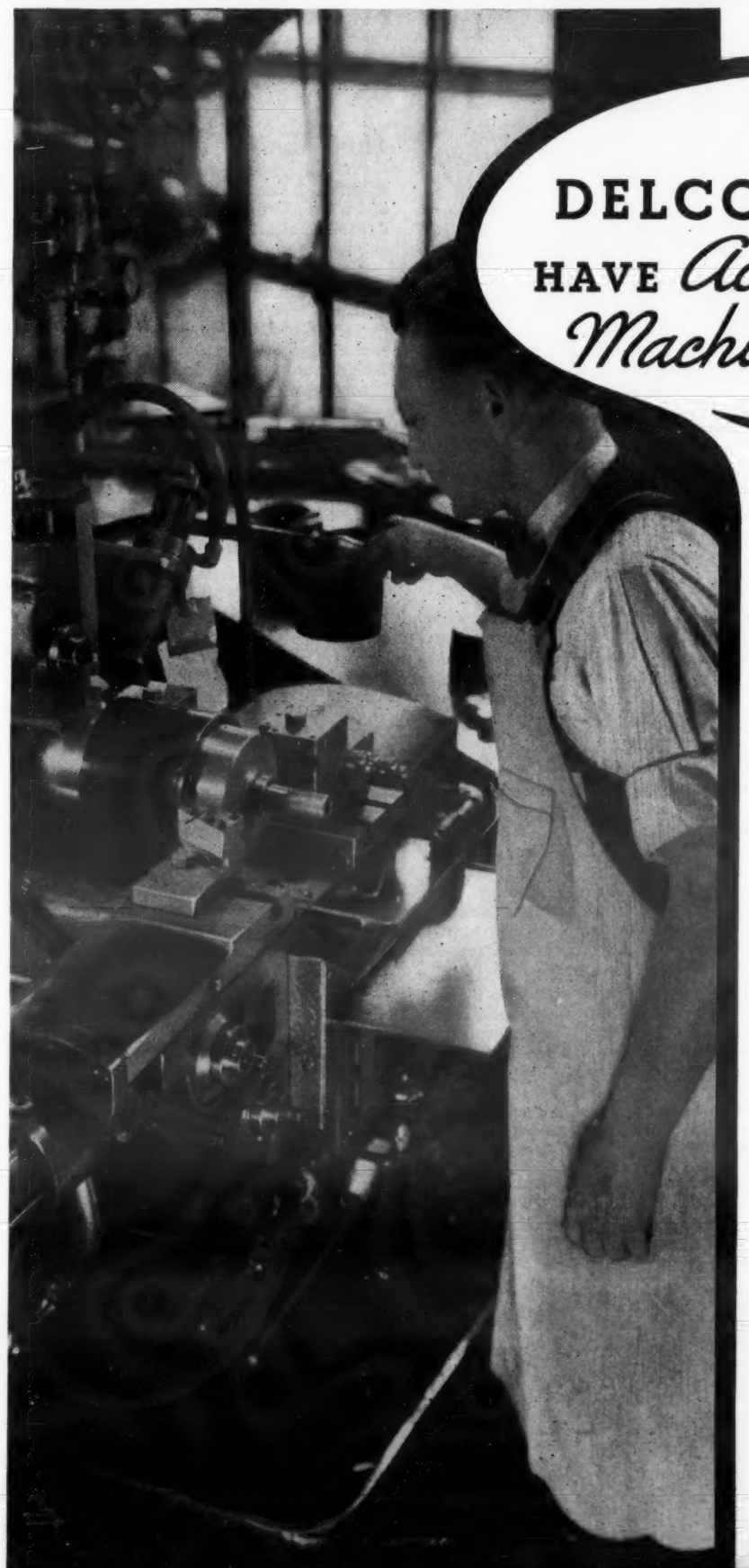
PHILADELPHIA—J. J. Pocock, Inc., local Frigidaire distributor, has just been appointed distributor for radio receiving sets and accessories by the Stromberg-Carlson Telephone Mfg. Co. here. The new distributorship will cover eastern Pennsylvania, southern New Jersey, and Delaware.

IT'S COMING!

SAV-A-STEP

Biggest Refrigeration Sales Feature for 1936

STEWART-WARNER

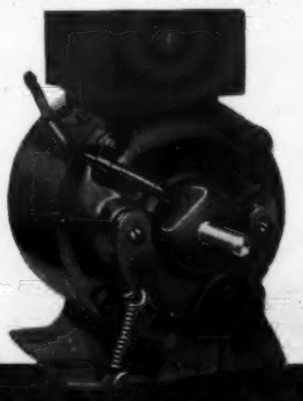


ALL DELCO MOTORS HAVE *Accurately Machined* PARTS

• Concentricity of the revolving and stationary parts of an electric motor is necessary if good performance is to result. To accomplish this essential requirement, all machining must be accurate. In Delco motors, required tolerances are assured by new and better methods of manufacturing developed by Delco engineers. In fact, Delco engineers have made significant improvements in almost every production operation—one important reason why Delco motors are so quiet and so reliable in performance.

DELCO PRODUCTS CORPORATION
DAYTON, OHIO

Made in Canada by the McKinnon Industries, Ltd., St. Catharines, Ont.



DELCO MOTORS

PERSONALITIES

By George F. Taubeneck

This Agency Business

Last night at the Auto Show we ran into an old friend, one whose name hasn't turned up in this department for too long. It was "MIKE" MAHONY, who used to be merchandising manager for the General Electric refrigeration department, and who is now identified with the Maxon, Inc., advertising agency.

Mr. Mahony (and his attractive wife) had plenty to say about the new cars—but nothing for publication, inasmuch as he'd like to cash in on some of the ideas he had derived from his examination of the exhibits.

Although he might not wish to be quoted on the new cars, Mr. Mahony certainly did have an effusion of joyous things to say about TED QUINN resigning from the vice presidency of the General Electric Co. to become president of Maxon, Inc.

"What's it all about?" we asked Mike. "Why are so many of the industry's better minds joining advertising agencies this year—men like Mr. Quinn, "HIKE" NEWELL, VANCE WOODCOX, WALTER DAILY, DICK SHAW, A. B. DICUS, ELMER SYLVESTER, and yourself?"

"The answer, George," smiled Mike, "is that the advertising agency business is a good business."

* * *

'Doing Something'

In the summer of 1930, on a restful island in Lake Ontario, the writer lost a small skirmish with Mr. Quinn.

At that time we were running a series of biographical sketches of refrigeration industry leaders. Mr. Quinn was especially bright among the industry's leading lights, having just piloted General Electric to the top of the household electric refrigeration heap in an amazingly short period of time.

We were anxious to print his story; it would have been first-rate news, and no doubt would have been read widely and avidly.

But no. Said Mr. Quinn (so winningly that we almost forgot to feel sorry about losing the "sale"):

"Wait until I've really done something."

When he was elected vice president of the General Electric Co.—only 37 years of age, he was the youngest man ever to attain that position—we thought surely he had "done something." In New York we tried to interview him to get the story of how he did it.

But again, no.

And now, after 24 years with General Electric, he leaves to become the president of an advertising agency.

This time we're not going to wait for Mr. Quinn to "do something." He'll always be doing something, and we'll be wearing whiskers clear down to here if we wait until his restless ambition is satisfied.

So here comes a story of TED QUINN—as best we can patch together and hook up the few facts and fancies about his life which seem to be available.

This is by no means an adequate biographical sketch, nor does it give a picture of the man—only glimpses. Yet——

Its timeliness—nothing else seems to be eligible this week as a topic for conversation when two or more men from the refrigeration industry get together—pushes right off this page a description we had already prepared of a visit to one of the most interesting laboratories we have ever seen: the new one just set up by Chicago Vitreous Porcelain Enamel Co. Of that, something next week.

* * *

The Man Quinn

General Electric distributors are most likely to conjure a picture, when the name TED QUINN flashes into their consciousness, of an earnest young man standing underneath a tree, a summer breeze ruffling his fine-spun brown hair as he talks so sagely and sanely that men 30 years his senior listen raptly and wonderingly.

Each August the specialty distributors who have figured so largely in Quinn's success meet to preview new models, argue with one another and with G-E executives in the most democratic of open forums, and listen to Mr. Quinn's "Summary."

This last concludes several days of conferences, is always delivered out-of-doors (the Weather Man has been kind), and is invariably voted the stand-out adventure of the meeting.

"I came all the way from California just to hear that talk," GEORGE BELSEY or somebody will say, and the man next to him will agree fervently.

If this sounds too worshipful in cold print, please let us assure you that, if anything, we have been guilty of understatement!

Ask any man who has heard one of those inspired, prophetic, intensely human speeches underneath the Old Elm at Association Island, or the Spreading Chestnut Tree at Nela Park.

Mr. Quinn's speeches leave them speechless—until they get home. After which they go out and stage a fall selling program which leaves the industry speechless.

General Electric's fall refrigeration campaigns are always the despair of competition; and there are those who give TED QUINN's August meeting's-end speeches much of the credit.

* * *

Fighting Irishman

Irishmen are generally well-liked because their emotions motivate their actions so healthily and so unapologetically. They are great fighters, great lovers, great laughers, great comrades, great orators; men of deep sympathy and understanding, with vast capacity for affection and loyalty.

TED QUINN is an Irishman. Almost everybody loves him who knows him (this is beginning to sound like an obituary in the present tense), and the loyalty he inspires is something you must observe at first hand to believe.

Yet he is a knock-down, drag-out fighter who'll take on anybody at any time, and who'll scrap until he can no longer wiggle a fingernail.

People have learned that he cannot be impressed, scared, or fooled; and that the only way to deal with him is honestly, openly, frankly, with all the cards face up.

He is so very HUMAN—and that, we think, is where his tremendous appeal lies.

* * *

24 Years Is a Long Time, Says Mr. Quinn

When Mr. Quinn was asked for an explanation of his surprise resignation, he grinned:

"Once every 24 years a man may well consider making a slight change."

Twenty-four years *is* a long time. For Mr. Quinn, it was long enough to work up from the very bottom almost to the very top of one of the biggest corporations in the world.

When you see him you won't want to believe that he has been with General Electric for a score-and-four years, so young does he look; but when you hear him talk, you'll believe it easily enough. He has obviously had a wealth of experience, and has rationalized this experienced into a remarkably clear philosophy of business.

Alger Story

'Way back in 1911, just after he had finished high school, TED QUINN went to work for G-E as a shipping clerk in one of the Cleveland incandescent lamp factories.

By day he was working his way up; at night he was studying law, so that the ascent to the top could be continued and accelerated. In 1915 he was graduated from the Cleveland Law School, and at the age of 21 he was admitted to the Ohio bar.

But that wasn't enough. He began the study of accounting, and finished that course.

Back to the career itself: Successively he filled these positions—stock clerk, billing clerk, factory foreman, stock inspector, accountant, credit manager, division manager, miniature lamp sales manager (1922), assistant general sales manager of the incandescent lamp department (1925), manager of the electric refrigeration department (1927), and vice president (1930).

In addition to his duties as vice president, he was chairman of the appliance sales committee, chairman of the General Electric Contracts Corp. (which he fathered), and organized the G-E air-conditioning department.

Nor has he finished working for General Electric. First of all, in addition to his duties as president of Maxon, Inc., he will be the account executive on all General Electric advertising placed through the Maxon agency. Second, he has effected a retainer arrangement with the General Electric Co., whereby he will act as consultant on questions of public relations and sales promotion.

Valedictories (new verb: dictionary publishers please note) President GERARD SWOPE of General Electric:

"We have a high appreciation of the work that Mr. Quinn has done in the 24 years of his association with the company, and are happy to say that a retainer arrangement has been made with him. Our good will and best wishes go with Mr. Quinn in his new work."

* * *

The Monitor Top

To many, if not most, readers of ELECTRIC REFRIGERATION NEWS, the story of what Quinn and "Zim" (P. B. ZIMMERMAN) did with the G-E refrigerators is highly familiar.

When they were given the job of merchandising the household refrigerator which Designer CHRIS STEENSTRUP had wetnursed out of the House of Magic, they started out, with a couple of dinky offices and a funny-looking refrigerator.

When we say "funny-looking refrigerator" we mean no disparagement of the G-E unit. No one sees anything funny about it now; but at that time the industry actually *laughed* at it and ridiculed it. Nobody, said the wiseacres, could sell a refrigerator with that "squirrel cage dust-catcher" on top.

But "Quinn and Zim" capitalized upon their product's apparent weakness. They called it the "Monitor Top," and almost made it the universally recognized symbol of electric refrigeration, just as the trade name "Frigidaire" had already become the generic term in common use for this product.

They were further handicapped by higher prices than those quoted by their competitors. But this they counteracted by stressing the *freedom from trouble* of the Monitor Top, inventing the dynamite slogan, "Not One Cent for Service," and introducing the long-term guarantee.

Gathering around them a group of active young men like GEORGE CHAPMAN, GUS MAYER, RALPH CAMERON, "MIKE" SWEENEY, JOE DONOVAN, WALTER DAILY, GEORGE KOBICK, WALTER LANDMESSER, HARRY MEALEY, and "MIKE" MAHONY, they really "went to town."

Starting from scratch, the General Electric Monitor Top led the field in total sales *in its third year*, with a $50,000,000 volume. This record was established against the strongest, smartest, and most alert competition in the history of specialty selling.

* * *

Enlisting Distributors

Perhaps the most important job that Mr. Quinn did was accomplished right at the outset. He became convinced that electric refrigerators should be sold by specialty distributors and dealers *who handled that product exclusively.* But selling that fundamental concept to the widespread General Electric organization was "something else yet again."

G-E appliances at that time were all sold through the General Electric Supply Co., a long-established system of company-owned jobbers located in principal cities. Naturally these jobbers wanted this "hot" new product, and it seemed entirely illogical to them that *new* jobbers should be appointed for the refrigerator when they were already set up to handle it.

But Quinn sold his idea, and then he and "Zim" went about the task of lining up the right specialty *distributors.* They were either remarkably fortunate or remarkably astute — perhaps both — in picking these men; for nearly all of these new distributors turned out to be winners during that opening drive.

In some cases these distributors were G-E organization men who were set up in business by the parent company; in others, they were highly independent business men. In all cases, the distributors were aggressive, youthful, and promotion-minded.

As a result, the refrigeration department became at one time the biggest (in dollar volume) department of the General Electric Co., passing even the lamp division. And around the electrical industry the observation was generally voiced that this was "the best merchandising job ever done by G-E."

* * *

Long-Term Guarantees

A whole saga could be written about the Battle of the Guarantees. It was probably the biggest fight in which TED QUINN was ever a participant. In it, he took on, single-handed, the entire refrigeration industry.

First the Monitor Top was guaranteed for two years. The industry met that—with grumbling. Then G-E went to three years, and the industry met that—going Quinn one further by guaranteeing the cabinet also for three years.

The race ended, however, when G-E stepped the guarantee period up to four years, then to five years. The "guarantee" is now officially called a "five-year *service plan.*"

The details of that fight need not be regurgitated here. As a matter of fact, the war may not be over yet. But up to this time, at least, Mr. Quinn has maintained his stand—not only against the industry-at-large, but against the NRA, during the reign of the late, unlamented Blue Iggle.

* * *

Lou Maxon, Teammate

Under the new arrangement, LOU MAXON goes titleless in his own agency, although he retains full control. We feel sure that this does not mean that the brilliant Lou is going to retire into his kitchen (he is one of the finest and most enthusiastic amateur culinary experts in the country) and his spaghetti-tasting.

On the contrary, the team of Maxon & Quinn will probably turn out to be something extra special. They have always liked and admired each other, and have generally agreed on fundamentals. Add to that their loveable personalities, and a combination very much worth watching should jell out—they are so very HUMAN.

* * *

Answer to Questions

Perhaps the following general letter to department managers and distributors, sent out early this week by Mr. Quinn, should be postscripted:

"In this same mail you will receive a new statement of the General Electric Appliance Sales Policy, also the announcement of several organization changes, including my own resignation as vice president of the General Electric Co. and from the other positions which I hold as an officer in associated companies.

"The best answer I can make to friends who may question my action and who urged me to remain, including Mr. Swope, is that I prefer the new arrangement. Notwithstanding the usual uninformed gossip which circulates under circumstances like these, I want my good friends to know that everything has been happily managed according to my own desires.

"I shall continue as a director of several associated companies and maintain a close relationship with the General Electric Co. and its commercial activities. My new work will permit me to describe my own limitations, to expand into other fields and perhaps be more useful to you on that account.

"We have passed successfully through most trying conditions and face a promising future, particularly those of us fortunately established in the electrical industry in association with the General Electric Co. I not only pledge you my continued friendship and goodwill and wish for you greater success, but as you will learn from the announcements, I shall be on hand to help you realize it."

No Flood, Storm, Fire, Nor War

Joseph Horak, whose Horak commercial refrigeration equipment is sold throughout Czechoslovakia, was a recent visitor to the home of Electric Refrigeration News. A shipmate snapped this deck picture of Mr. Horak reading the News, of which he writes: "Let no flood, no storm, no fire, no war stop you from mailing us the Electric Refrigeration News.

"America Needs More Modern Homes" Says T. K. Quinn, New President of Maxon, Inc.

Sales Idea of the Week

By V. E. (Sam) Vining, Director of Department Store Sales, Westinghouse Electric & Mfg. Co.

I know a man who has a reputation for being a very fine extemporaneous speaker.

Yet, to my knowledge, he has never made an extemporaneous speech in his life.

When the toastmaster calls on him unexpectedly, I have watched him closely. He plays for time. He tells a story, or semi-stumbles through a standardized introductory paragraph, in a manner which gives the impression of being slightly overcome at the opportunity offered him to talk to such a distinguished assembled company.

As he makes this opening talk he is studying his audience, to determine what may interest them. Suddenly he remembers an anecdote he told at the Elks Convention a week ago and repeats it. This gives him time to develop a theme he thinks will interest his audience, and he picks this theme from a talk made two months ago at another meeting. So on, down the line he studies his audience, picks old sentences, thoughts, and themes from other meetings and binds them into a connected story which meets the present situation.

I have learned a lot of selling from him.

In the first place, I have noticed that every talk, regardless of subject or condition, always eventually swings into a discussion of business angles in which he is an expert. No one ever succeeds in tempting him to talk about things with which he is not thoroughly familiar. As a result, his talks are always instructive and worth listening to, even though they may be imbedded in a bit of dramatics and humor which makes each one seem different from the last one.

I notice, too, that when he starts on a story, or gives figures, he never hesitates, showing advance preparation and a thorough knowledge of his subject.

Third, I notice that he never jumps into the body of his talk without taking time to study his audience, feel out their reactions, and determine the best manner to approach his subject.

I repeat, he has never made an extemporaneous speech in his life—despite his reputation.

And I add——

No man in the history of oratory ever made an extemporaneous speech worth listening to. And——

No salesman ever made an extemporaneous sales talk that was worth an order.

Rogers Builds Service Shop on Wheels

PITTSBURGH—C. R. Rogers Co., Kelvinator distributor, has combined service and advertising with a complete "shop on wheels," used in connection with commercial and air-conditioning installation work.

The truck is completely outfitted with ladders, racks, and bins for tubing, fittings, wiring, gas drums, gauges, and tools, and carries everything necessary for the completion of the job.

Strange & Lowry Promoted By General Refrigeration

BELOIT, Wis.—Two shifts in its executive personnel have been announced by General Refrigeration Sales Co., makers of Lipman commercial and air-conditioning equipment. Hugh Strange, formerly manager of the company's Kansas City branch office, has been transferred to the managership of the Chicago office, and H. B. Lowry, a salesman in the Kansas City district, has been named to succeed him in that office.

Cheap Power Rates Feature Milwaukee Merchandising Plan

MILWAUKEE — Electric refrigerator and appliance dealers in the territory served by The Milwaukee Electric Railway & Light Co. are planning to build a good portion of their Christmas sales campaigns around the new "Ten for One" plan, which the utility has recently announced.

This plan is designed to induce users of electric current to increase their consumption, at a very low rate for the additional current used. It will run from December to June, 1936, and will permit the customer to increase his use of electricity up to 100 per cent above the amount for which he was billed during the corresponding month of the previous year, at an increase of only 10 per cent in his bill.

For all current used in excess of a 100 per cent increase, the rate will be 2 cents per kwh.

Norton Heads Refrigeration Dept. in Los Angeles Store

LOS ANGELES—E. A. Norton has been appointed head of the electric refrigerator department of the Broadway Department Store, Inc., here. Mr. Norton was formerly manager of the Westinghouse electric refrigerator department of Ray Thomas, Inc.

During his 25-year career in selling electric appliances, Mr. Norton has also traveled the Alaskan and northern states, as a salesman, specialized in electrical equipment for shipyards and merchant marine vessels, and managed the home wares departments of Barker Bros. department store here.

Keeping Salesmen Selling Refrigerators Only All Year Boosts Dealer's Sales 300 Per Cent

DENVER — Sales specialization—that is, keeping refrigerator salesmen selling refrigerators 12 months out of the year—has enabled the housewares department of Joslin Dry Goods Co. here to increase its October refrigeration business 300 per cent over the same month last year.

Although the housewares department sells radios, washing machines, gas ranges, and small appliances, the sales staff of the refrigeration division sells nothing but refrigerators the year around. And it's working out, too, says H. A. Armwright, manager of the department.

"We look to the large volume of the 'heavy' months to make up for the slack periods in a salesman's record," he reports. "The fact that all of our men are veterans, having been with us more than a year, shows that the idea is working.

"While some stores feel that they do better by switching a staff from refrigerators to, say, radios, in the fall and winter, I find two advantages in our plan:

"First, our men concentrate harder on prospects in the slow periods, and our winter volume jumps.

"Secondly, it has been our experience that specialization makes better salesmen, in every season."

The Joslin refrigerator sales crew works entirely outside the store. Eighty per cent of the store's sales are credited, directly or indirectly, to this outside contact work.

Only one salesman is permitted to be on the floor at a time, except by appointment with a prospect. Display is emphasized—in the department, on the main floor in summer, and in windows—with the combined aim of completing sales brought in by outside contacts, and building prospect lists.

Promotion plans are geared to the needs and demands of the sales staff. During last summer, for example, the main floor display was moved to the store lobby in the early evening, and a salesman was kept on duty between 6 and 9 o'clock.

This attracted the evening window shoppers, many of whom never got down to the business district during daylight hours. Passers-by, interested by the lobby showing, were taken downstairs to the regular department display. The plan increased prospect lists and sales for the whole staff, without a wasteful increase in overhead, necessary if the whole department were kept open.

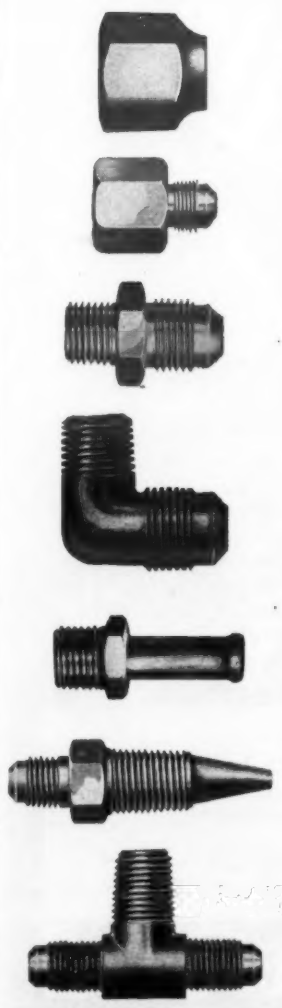
Four or five lines of refrigerators are always carried by the department, and the first step, in training new men, is showing them the difference between these lines. Competitive lines, not stocked by the store, are also studied. Then, relating his knowledge to each prospect's needs, concentration by a salesman on one line means more sales, Mr. Armwright says.

Cold canvass calls are made under guise of a "survey," being made to determine the number of electric refrigerators in Denver homes. Prospects uncovered through this or any other method are followed up and closed by the individual salesmen, without assistance from any other member of the staff. This arrangement has met with unaminous approval from the present force, he says.

"In February, the Denver refrigeration market was only 21 per cent saturated," he adds. "Now, the figure is close to 30 per cent."

And this fact, if you ask Mr. Armwright, constitutes another justification for selling refrigerators the year around.

REPUTATION



Reputation, they say, "oft hangs by a thread". It is true the quotation refers to threads of textile character yet threads of other types often make, or break, reputations.

For instance, take the threads on Commonwealth fittings. They must make-up tight in service or the reputation of our fittings would be lost, to say nothing of the job on which they are installed. They must fit, without trouble or added service. They must all be S.A.E. No. 3 fit—accurately cut—uniform in every particular.

Commonwealth Fittings are judged by the excellence of their threads.

For more than 20 years, users of Commonwealth Fittings for refrigeration purposes have safely relied on us as their preferred source of supply for Seepage-Proof Fittings "Built Right to Stay Tight".

In addition to the most complete line of standard fittings, in every commercial size, we make special fittings to order. Send us your sample, blue-print or sketch. Quotations promptly.

COMMONWEALTH BRASS CORPORATION
Commonwealth at G. T. R. R. Detroit, Mich.

IN addition to all the features and conveniences found desirable by the average housekeeper, Leonard provides a refrigerator cabinet that will maintain its fine appearance.

Under the cabinet enamel finish is the rust preventing quality of Bonderizing. This is an invisible value that will be appreciated by the owner, as it holds the finish, prevents chipping or peeling, and stops the spread of rust if the finish is accidentally injured.

This is an important sales feature and the customer will be glad to know about it. It is assurance of greater satisfaction to the user and lower servicing costs to the dealer.

PARKER RUST-PROOF COMPANY, 2197 E. Milwaukee Ave., Detroit, Mich.

A new book, including all a salesman should know about Bonderizing, is available. Send for your copy now.

PARKER RUST-PROOFING processes

COMMERCIAL REFRIGERATION

Liquor Commission Uses Lipman Units For Wine Storage

AUGUSTA, Me.—Lipman refrigerating equipment is being used by the State of Maine Liquor Commission to cool and safeguard the choice domestic and imported wines which it merchandises through its 24 state stores.

The Commission, governed by a board of three of which David A. Walton is chairman and Louis B. Fleming and John B. Couture associates, not only sells to its own retail stores, but also maintains a warehouse department in Augusta, which handles all hotel business in the state.

Opened last December, the state stores had done $2,425,000 worth of business by September of this year, and it is estimated that the total income will top $3,000,000 by the end of this month. This will mean a profit to the state of about $500,000.

The main warehouse is cooled by a Lipman methyl chloride unit, Model 503, water cooled. In addition, each of the 24 retail stores is served by a Model 54 Lipman air-cooled machine. A temperature of approximately 55° F. is required in the warehouse and retail store wine storage vaults.

Sales and installations were made under the supervision of Gordon J. Malone, branch manager of General Refrigeration Sales Co.'s Cambridge, Mass., office, and James N. Craig, state refrigeration engineer.

Zero Temperature Held by Ice Cream Truck System

PHILADELPHIA—A Kelvinator 1-hp. compressor and three vertical Kold-Hold units maintain temperatures of 0° to 2° F. in the refrigerated truck operated by Coleman's Ice Cream Co. here.

Insulation consists of 7½ in. of Dry-Zero in roof, 6 in. of the same material in the walls, and 6 in. of cork in the floor. Body of the truck was built by the Keystone Wagon Works, Inc. of Philadelphia, and is mounted on a Ford 1½-ton chassis.

Sale of Cheese Cases Boosts Total Value Of Orders

ST. LOUIS—By talking up the value of a separate compartment for the display of cheese and other delicatessen, in addition to the regular cases for displaying meats, E. E. Barbee, manager of the McCray branch office here, has increased his sales this year to a large degree.

"We have sold three 6-foot cases to taverns serving meals, which have increased their business by adding a cheese and delicatessen department," Mr. Barabee says.

Sale of a Model 306 DD was made to an establishment in Belleville, Ill., for another department of this kind.

One customer, who bought a special case for cheese and delicatessen display recently, has reported that this end of his business has become more profitable than his beer or meal business, Mr. Barbee reports. Increased business has necessitated the buying of a new electric slicer.

For the next year, Mr. Barbee plans to increase his sales by inducing customers who have a meat case at present to increase their profits by adding one for delicatessen products.

Servel Equipment Used On 125-ft. Yacht

PLEASANTVILLE, N. J.—Servel commercial refrigeration equipment has been installed in the 125-ft. yacht *Alura*, owned by Edward W. Coppage of this city. Equipment was purchased from the Ace Machine Co., Servel distributor in this territory.

Boy Scout Camp Installs York Condensing Unit

ROCKVILLE, R. I.—For food-preserving purposes, Camp Yawgoog, boy scout camp near here, has installed a 2-hp. York Freon condensing unit. York Distributors, Inc., Providence, R. I., made the installation.

Individual Meters for Each Concession Used In Detroit Market

DETROIT — The Euclid-Hamilton Public Market, located in the north end of this city, has installed six York Freon condensing units to replace an obsolete refrigeration system. Concessionaires rent space from Joseph Holtzman, owner and manager of the market which handles dairy goods, meats, fruit, fish, vegetables, and delicatessen goods.

All refrigerating units are installed in the basement, and each concessionaire is furnished with a separate meter so he can pay for his power. All machines are entirely automatic.

The dairy department of the market has 34 ft. of single glass display cases and two coolers, 6x8x7 ft. These are refrigerated by a 2-hp. Freon condensing unit.

A 2-hp. unit maintains a temperature of 20° F. in a fish room, 16x6x7 ft., and 10° F. in a fish freezer 6x6x7 ft.

The fruit department has two coolers measuring 10x12x7 ft. and 11x14x7 ft., served by a 1½-hp. machine. The Gentile meat department, consisting of 34 ft. of display case and an 11x13x10-ft. walk-in cooler, is refrigerated by a 2-hp. unit.

A 1½-hp. machine cools the delicatessen department with 20 ft. of refrigerated display case and a basement cooler 6x8x7 ft.

Food Storage Rooms Cooled by Servel Unit

MOBILE, Ala.—Two food storage rooms of the large warehouse of the Delchamp Grocery Co., chain store organization of this city, have been equipped with Servel equipment.

Equipment consists of one 7½-ton Servel refrigerating machine connected to chilling units in each of the rooms, which measure 23x27x12 ft. Six retail stores are operated by the firm in Mobile, and another located in Pensacola, Fla.

Frigidaire Commercial Dealer Appointed

RICHMOND, Va.—R. F. Trant, Inc., Norfolk, Va., Frigidaire distributor, has appointed Electric Refrigeration Service, Inc., of this city commercial Frigidaire dealer for Richmond and vicinity. C. T. Paxton is manager of the new dealership.

McCray Gives Recommendations on Choice Of Air-Cooled or Water-Cooled Condensers

Some suggestions for solution of the problem "Which should I use, an air-cooled or water-cooled condenser" are given in a recent bulletin of the McCray Refrigerator Corp.

In answering this question, says the bulletin, a salesman should rely on his general knowledge, as a definite rule cannot be given due to the fact that conditions vary for different sections of the country.

Even in a given section there is a wide variation of operating conditions which affect the selection of a certain type of condenser.

Hot Water Inefficient

In general, it is recommended, water-cooled compressors should not be used for the southwest part of the country, because in that locality water lines are laid close to the surface of the ground, causing the water to be compartively hot, resulting in very inefficient operation and excessive wear on the compressor, as well as causing a lack of refrigeration.

There are other sections besides the Southwest where the water lines are laid close to the surface of the ground, or there may be instances where the water pipes run through hot rooms. In both these instances water-cooled compressors should not be used.

Factors Affecting Use of Water

If the water temperature is less than 65° F. as it enters the condenser, the water rates not too high, and the supply constant and unfailing, a water-cooled compressor may be considered, states the bulletin.

Consideration should be given to water rates or the source of water supply. Says the bulletin:

"We would certainly not recommend a water-cooled compressor for a country store in which the water supply must be pumped by an electric pump from a well or other source. Where electricity is quite high and water cheap, a water-cooled compressor would naturally be recommended and vice versa."

Another admonition—unless pipes leading to and away from the compressors are protected from freezing, a water-cooled unit is out of the question.

Use of Air-Cooled Condenser

As a rule, the bulletin states, an air-cooled compressor in a comparatively cool basement anywhere north of the Mason-Dixon line will give about as efficient operation as water-cooled compressors, with exceptions, of course.

If the compressor is located in a warm room or kitchen and condensing water available is comparatively cool and reasonably cheap, a water-cooled compressor should be used. Also, if the compressor is located where noise is objectionable, a water-cooled compressor should be used.

Low-Pressure Water Unsatisfactory

Where water-pressure at the inlet is less than 25 lbs. per square inch gauge, or if the demand for water in the building is great, causing the water supply and pressure to be low at times, the bulletin says water-cooled units are not to be recommended.

The bulletin, in commenting on the fact that there is a difference in capacity between an air-cooled and water-cooled unit driven by the same size motor, says that this difference in capacity cannot be attributed to the fact that a water-cooled compressor is more efficient, but is due to the fact that air temperatures vary much more than water temperatures.

Commission House Installs Units for Produce Rooms

KANSAS CITY—Two model 505 Lipman refrigerating machines have just been sold to the Fleming-Wilson Mercantile Co., commission house here, by the Kansas City branch of General Refrigeration Sales Co., manufacturer of Lipman equipment.

The job includes refrigeration of three banana storage rooms and four separate rooms for storing lettuce and roots, apples, citrous fruits, and meat. Total cost of the installation will amount to more than $5,000.

Holcomb & Hoke Name 6 New Distributors

INDIANAPOLIS—Addition of six firms to its distributors' organization in the New York, New Jersey, and Illinois territory was made last week by Holcomb & Hoke, manufacturer of refrigerated display cases.

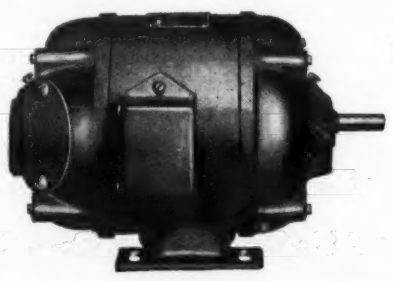
New distributors for New York and New Jersey are A. J. Orbach, Inc.; Dixon Bros.; Jersey Central Power & Light Co.; B. B. Rider Co.; and Aetna Refrigeration Co., Inc. R. Cooper, Jr., Chicago, was named distributor in the Illinois territory.

York Milk Cooler Displayed At Allentown Fair

ALLENTOWN, Pa.—A milk-cooling machine, utilizing a York Freon condensing unit, was on display at the Lehigh Valley Cooperative Farmers' booth at the Allentown Fair held here recently. H. M. Crowder, Jr. Co., local York distributor, furnished the unit, which was used to cool milk sold at the fair.

Ice Cream Firm Advertises On New Cabinets

CHICAGO—As a novel means of advertising its product and at the same time serving its public, the Carroll Ice Cream Co. here, applied "transfers" to 100 recently purchased Kelvinator ice cream chests, which carried the Carroll name and symbol and listed flavors of ice cream available.



Left—Century 1/6 Horse Power 1800 RPM Single Phase Motor

Right—Century 2 Horse Power, Repulsion Start, Induction Single Phase Motor

Century for

Commercial and Domestic REFRIGERATORS

For more than 20 years—dating back to the pioneering stages of the refrigeration industry—manufacturers and dealers have found, after years of experience, that Century Repulsion Start Induction Single Phase Motors satisfy their requirements . . . because Century Motors "Keep a-Running".

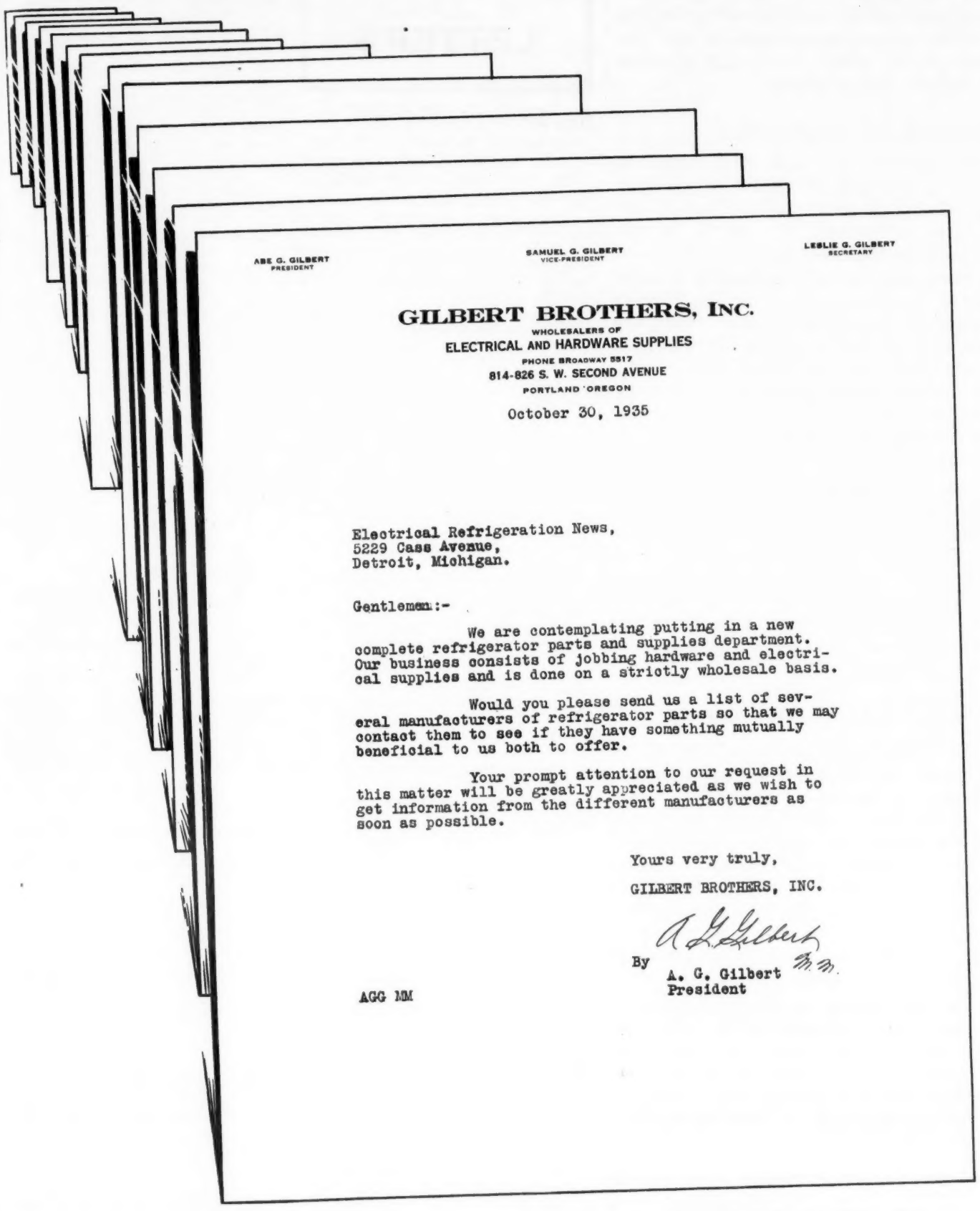
Century CENTURY ELECTRIC CO.
1806 Pine St. . . . St. Louis, Mo.
Offices and Stock Points in Principal Cities

MOTORS UP TO 600 HORSE POWER

IT is so much easier to close commercial jobs when you have so many Copeland selling advantages to help you. Copeland's remarkable efficiency and performance record is now known far and wide. Copeland's long-time operating economy proves to be irresistible to careful equipment buyers. Remember, behind every Copeland unit is the experience, facilities, talents, recources and stability of the Copeland organization. A few franchises are available to qualified distributors. Write us.

COPELAND REFRIGERATION CORPORATION
Manufacturers of a complete line of Household and Commercial Refrigeration
Holden Ave. at Lincoln . . . DETROIT, MICH.

Copeland
DEPENDABLE Electric REFRIGERATION



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GILBERT BROTHERS, INC.
WHOLESALERS OF
ELECTRICAL AND HARDWARE SUPPLIES
PHONE BROADWAY 5517
814-826 S. W. SECOND AVENUE
PORTLAND OREGON

October 30, 1935

Electrical Refrigeration News,
5229 Cass Avenue,
Detroit, Michigan.

Gentlemen:-

We are contemplating putting in a new complete refrigerator parts and supplies department. Our business consists of jobbing hardware and electrical supplies and is done on a strictly wholesale basis.

Would you please send us a list of several manufacturers of refrigerator parts so that we may contact them to see if they have something mutually beneficial to us both to offer.

Your prompt attention to our request in this matter will be greatly appreciated as we wish to get information from the different manufacturers as soon as possible.

Yours very truly,
GILBERT BROTHERS, INC.
By A. G. Gilbert
President

AGG MM

New Business for the Parts Manufacturer

Typical of the rapid growth of the refrigeration supply business is the entry of this Pacific coast wholesaler into the business. And typical, too, of the jobbers who make up this alert group, he comes to the News *first* for information.

There are now about 100 refrigeration supply jobbers doing business in the leading cities of the country. In another year there will probably be 200. These companies sell the replacement parts and supplies used by thousands of independent service men, distributors, and dealers.

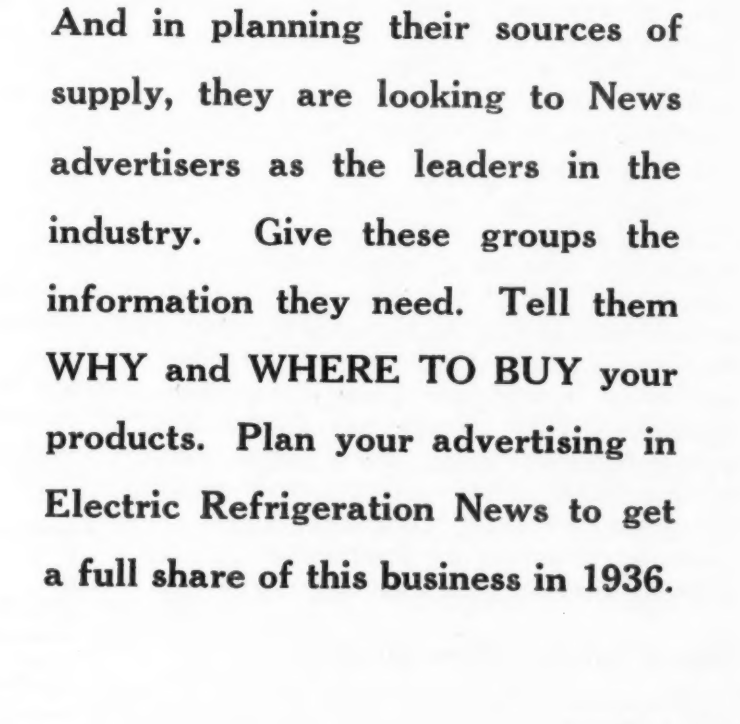
With millions of household and commercial installations no longer covered by a manufacturer's guarantee and over a million and a half new units being sold each year, this parts business is worthwhile.

The parts and supplies section of the industry is still in the formative stage. And parts manufacturers who take the lead in this period of development will have a big advantage. Right now is the time to establish recognition for your company and your products among jobbers and service men.

You can do this job economically, and do it effectively, by keeping your sales message in Electric Refrigeration News. In its tenth year of service to the industry, it is recognized around the world as the news center for every branch of refrigeration activity. What is more natural than for supply jobbers and service men to turn to the News for the information they need? From every section of the country, that is just what they are doing.

And in planning their sources of supply, they are looking to News advertisers as the leaders in the industry. Give these groups the information they need. Tell them WHY and WHERE TO BUY your products. Plan your advertising in Electric Refrigeration News to get a full share of this business in 1936.

★ P. S.



EXCLUSIVELY WHOLESALE
DISTRIBUTORS NORGE PRODUCTS
Gunn Distributing Co.
417-419 W. CAPITOL AVE.
Little Rock, Ark.
DISTRIBUTORS RCA-VICTOR PRODUCTS

November 7, 1935.

Refrigeration News,
5229 Cass Ave.,
Detroit, Michigan.

Gentlemen:

We are contemplating going into the replacement parts business on a wholesale basis on electrical refrigerators. Also we are interested in a jobbing proposition on Sulphur Dioxide and Methyl Chloride.

We would appreciate it very much if you would put us in touch with some reliable manufacturer on the above products.

Thanking you, we are

Yours very truly,
GUNN DISTRIBUTING CO.,
By W. W. Evans
Sales Manager

WWEvans/d

NORGE WITH ROLLATOR — NRA — RCA-VICTOR

★ P. S. When we say they are coming in fast, we really mean it. Here's another, from a distributor.

BUSINESS NEWS PUBLISHING CO.
5229 Cass Ave., Detroit, Mich.

ELECTRIC REFRIGERATION NEWS

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VOL. 16, NO. 11, SERIAL NO. 347, NOV. 13, 1935

Rural Market Beckons

HINTS are being whispered into some of the right ears around the industry that a new kerosene-operated refrigerator or two may be ready for distribution next year. So consistent and insistent has been the demand for this product that numbers of refrigeration engineers have been working on absorption system machines during the last couple of years. The problem of designing an absorption machine which does not conflict with existing patents is apparently a tough one; but it appears that the engineers think it can be done.

Dealers who have specialized (like Abou Ben Adhem, may their tribe increase!) in selling gasoline or kerosene-operated refrigerators to farm homes declare that sales resistance to this product rates among the lowest of any they have ever tried to sell. Farmers generally have big families of hearty eaters; and the problem of satisfactory food storage has always been a brow-wrinkler for them. Ice is rarely delivered on rural routes, and if electricity is not available, the absorption type refrigerator operated by kerosene, gasoline, or compressed gas is a Godsend to many farm homes.

Should Interest More Dealers

Electrolux, which has done an outstanding job of supplying this demand (and, incidentally, made the way very easy for possible competitive salesmen by putting out refrigerators which work like a charm and gather good will) maintains that the only limit there seems to be to their sales volume on this product is the number of qualified dealers they can interest in pushing it.

It would appear, moreover, that the prospects for selling *electric* refrigerators to the rural market will be greatly improved in certain localities. Already the Rural Electrification Administration has approved seven projects that will bring electrical service to 4,000 farm homes which have never known the joys and conveniences of the magic genii before. More will follow.

Valuable Sponsorship

Construction of these power lines is to begin immediately, with labor drawn from local relief rolls. As a sample of these projects, a study of that assigned to Boone county, Indiana, may help envisualize the new opportunities these projects should open up to refrigeration and electrical appliance dealers. The Boone project embraces 587 miles of new electric lines, which will reach 2,200 new rural customers. The entire cost, up to $567,926, will be loaned by the Rural Electrification Administration to the Indiana State-Wide Rural Electric Membership Corporation—a farmers' cooperative organization which is sponsored by the Indiana Farm Bureau, and the establishment of which was authorized by a statute recently enacted by the Indiana legislature. Thus the use of electricity and electrical appliances by Boone county farmers is something which will be authorized, encouraged, and promoted by the United States government, the state of Indiana, the Farm Bureau, and the farmers themselves. What a set-up for electrical appliance dealers and salesmen!

Loans Available for Appliances

It is also interesting to note that loans will be available to farmers for house wiring, and for the purchase of electrical appliances and electrical farm equipment. The Rural Electrification Administration realizes that the power lines they erect must be used adequately in order to be justified, and hence will be selling farmers on the idea of borrowing money from the government to buy electric refrigerators, ranges, washing machines, pumps, utility motors, etc. These loans will be made chiefly by the Electric Home & Farm Authority, which will finance the paper on sales made to these new rural customers by local dealers.

Refrigeration dealers who go after this business will probably also find a ready market for electric water pumps, which will bring running water into farm kitchens, and make possible—in most instances for the first time—the installation of inside bathrooms and sanitary equipment. This is a product for which few dealers have acquired a franchise, but seems to be a definite profit possibility.

Farmers Now Have More Money

From the standpoint of manufacturers of both absorption and compression type refrigeration equipment, it would seem that promotion directed to the farm market might be highly fruitful of results in 1936 and 1937. Large-sized household refrigerators, milk coolers, and meat coolers can all be sold in profitable volume to this practically untapped market. Farm income has jumped materially in the last couple of years, and the farmers are enjoying the thrill of spending real cash again.

Moreover, the opening up of electrical service to thousands of farm families which have never enjoyed it before will be almost like the unfolding of a miracle. It will be uppermost in the minds and conversations of these newly electrified homes, and salesmen will do well to "get 'em while they're hot."

WHAT OTHERS SAY

Good News from the Heavy Industries

TWO events of a recent week deserve special comment from observers of the business scene who like to know which way the wind is blowing. One was the remarkable machine tool show in Cleveland, an 11 days' exhibition which attracted 10,000 buyers and was the largest show of the kind ever held; and the other was the convention of the National Industrial Advertisers' Association in Pittsburgh, the most largely attended and most enthusiastic meeting of this important organization held in at least six years.

These two events emphasized a fact which has been evident for some time, and that is that the durable goods industries are rapidly coming back. While not every division of manufacturing dependent upon industry for its sales and profits is enjoying the prosperity now recorded by makers of "the master tools or industry," the ably large attendance at a meeting like that of the improvement is so general as to be reflected in a remark-N.I.A.A., whose members sell machinery, materials, and supplies to industrial consumers.

It should be remembered that this depression has been a depression of the capital goods industries. They were flattened out to a degree not imposed on the industries which supply the needs of the general consumer. In those industries has lain the bulk of employment; and as they return to a normal level of activity, of production, employment and sales, the depression for the whole country will be practically eliminated.

Normal operations and normal payrolls for the heavy industries mean increased buying power for the things that all consumers require: for food products, clothing, automobiles, household furnishings, and the like. Thus the return of a substantial measure of prosperity to the durable goods industries means that all other industries will immediately benefit from their improvement.

When Gen. Dawes predicted that the end of the depression would come about the middle of 1935, he meant that the demand for capital goods, repressed over a considerable period, would again make itself felt at a rate which would require greatly increased production of steel and other raw materials required for the production of machinery and other durable goods. The event, it seems to us, has justified his prediction.

The return to conditions somewhat approaching normal of a large section of the industrial field is another impressive example of the interdependence of all sections of the modern community. Even those who sell general consumer goods cannot be prosperous in full measure unless those who sell industrial goods are also operating at a normal rate.—*Advertising Age.*

LETTERS

Big Strides in England

International Refrigerator Co., Ltd.
169 Regent St., London, W. I.
B. T. H. Electric Refrigerators

Editor:

I have been a consistent reader of the REFRIGERATION NEWS for a number of years and of course I have found your publication invaluable in keeping me up-to-date with affairs in the industry.

It has occurred to me, however, that your paper lacks news on refrigerator activities in the foreign field. I am therefore particularly interested to read that a member of your organization is planning a world journey to see what other countries are doing. U. S. Department of Commerce figurges indicate that exports of American made refrigerators are rapidly increasing. Your paper is so complete in its domestic news that I feel sure its scope could be universally widened by introducing foreign news.

Perhaps few people in the States realize that outside of your country and Canada, Great Britain is the biggest market both for domestic and commercial refrigerators. Fewer still may know that ice cream conserving and making machines have an astounding sale in this country. Even in the reputed cold Scotland, a large ice cream business is done with machines retailing over $1,000 each. Your answer may be "Who cares?" While in London, we are rapidly becoming a city of apartment buildings each fitted with its individual refrigerator.

England has at last become refrigerator conscious—making the big stride from cellars and larders to mechanical refrigeration without the intermediary process of the ice-box.

Please permit me to extend an invitation to your representative to visit this Company when he is in England. We will gladly answer his questions, and tell him something about the peculiarities (often humorous) of marketing to a public who still don't like their drinks cold.

With my best wishes for the continued success of your vigorous paper.

H. C. TIMEWELL,
General Sales Manager.

Gift from Heaven

Debes & Co.
Electric Refrigeration Supplies
1249 East 105th St., Cleveland

Publisher:

We are enclosing two orders for the MASTER SERVICE MANUAL. I will say it is one of the best things I have seen in the refrigeration business. This would have been a gift from heaven eight years ago when I first went into business and I feel that there should be a large number of sales for this book.

KARL L. DEBES.

Wants to Handle Parts

Home Oil Burner Corp.
234 Main St., Hempstead, L. I., N. Y.

Editor:

Enclosed herewith, you will find our check for $3.00 covering one year's subscription to the ELECTRIC REFRIGERATION NEWS, and as we have been informed that you will furnish us with reprints on all Newcum articles in the MASTER SERVICE MANUAL, we would appreciate your mailing us the copy that we are entitled to with this subscription.

We are now in the oil burner parts, controls, and supply business. We are now adding refrigerator parts, controls, and supplies to our line. We would appreciate your running a news item to this effect notifying refrigerator parts, controls, and supply manufacturers to communicate with us in reference to their lines.

We have been serving Long Island and Queens oil burner dealers with their repair parts, supplies, and controls for the past five years and we are very much interested in this end of the refrigeration business.

Thanking you for any courtesies you see fit to extend us in this regard.

SID HARVEY,
President.

Prospect for Accessories

Trump Corp.
440 E. Genessee St., Syracuse, N. Y.

Editor:

Your editorial "Playing Santa Claus to Customers" in the Nov. 6 issue is a fine thought.

Now—can you help further by giving the names of some manufacturers who can supply this type of merchandise.

A. H. KASTEN.

Answer: See pages 253-256 of the 1935 REFRIGERATION AND AIR CONDITIONING DIRECTORY.

Drawings Upside Down

Detroit Lubricator Co.
Detroit, Mich.

C. L. Olin
Manager Applications Dept.
Servel, Inc.
Evansville, Ind.

Thanks for your letter of Oct. 29 calling our attention to Figures 3-A and 3-B of the article in ELECTRIC REFRIGERATION NEWS of Oct. 23.

This is one on the NEWS, and a copy of this letter goes to Phil Redeker as a reprimand for placing these drawings upsidedown. It certainly does not make much sense as shown, but we believe that these figures do demonstrate a condition which we have observed in practice.

On large air-conditioning hook-ups especially where numerous coil connections go into one large diameter suction header the oil loads up at the bottom end of the header, sometimes causing erratic action on the expansion valve bulbs. In addition to correcting the difficulty as shown in Figure 3-B (right side up) it can also be remedied as mentioned in the copy under Figure 3-B, namely by arranging the suction line to the bottom of the header instead of the top.

D. D. WILE,
Accessories Laboratory.

Likes Departmental Features of the News

Kold-Hold Mfg. Co.
Olds Tower Bldg., Lansing, Mich.

Editor:

I have been a reader of the NEWS for several years; and the manner in which the material is offered, the completeness of the various departments, and the many other features are worthy of sincere commendation.

O. D. GREENLEE,
Refrigeration Engineer.

More Information Than Any Other Trade Paper

1443 S. Third St.
Louisville, Ky.

Editor:

Please find enclosed check. Send me ELECTRIC REFRIGERATION NEWS for six months. I just cannot do without this publication. Receive more information and news from this than any other trade paper in the appliance field.

H. E. CULLEY.

How Best Advertise A Service Business?

Complete Home Service Co.
1 W. Park Blvd., Villa Park, Ill.

Editor:

We wish to make some flyers to distribute to all homes in Villa Park advertising our refrigerator service and calling attention to savings which will result from proper maintenance of domestic equipment. Will you send us any ideas or information that you can concerning what to include in the copy? Can you give us an estimate of charges to be made on various service jobs? Do you think prices should be quoted on the flyers?

In this connection we also need before and after photographs or illustrations of condensers, door seals, etc.

Can you help us to find this and any other information which might be of value in promoting service business? We shall be appreciative of your efforts to help us.

PAUL W. BEEDLE.

Answer: The article by E. A. Seibert, service manager of Kelvinator Corp., published on page 16 of the Oct. 30 issue of ELECTRIC REFRIGERATION NEWS, offers several valuable suggestions on how to operate a refrigeration repair shop.

With respect to the type of information that should be included in your "flyer," it should certainly contain such fundamentals as your name and address, telephone number, what hours of the day you offer service, the period for which you guarantee your work, the name of the equipment which you can repair (in some cases it might be advisable to give the names of the leading makes of refrigerators on which you can offer service), and the number of people on your staff (if it is reasonably large).

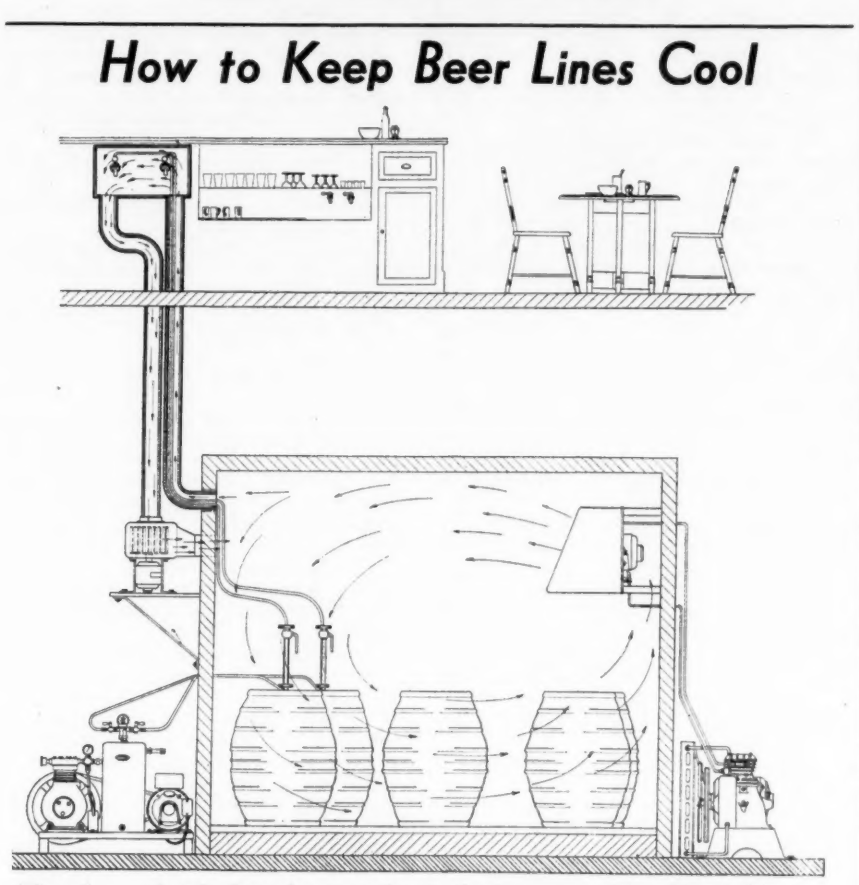
The question of charges is always a tough one, but at the recent Refrigeration Service Engineers' Society convention here one suggestion that seemed sound was that a service man should make his charge the labor cost plus 200 per cent of the cost of the materials.

As it is not generally easy to determine in advance just how much labor and material must be expended in making repairs on electric refrigerators, it would hardly seem advisable to quote prices in your advertising.

With respect to your request for "before and after" pictures of various refrigerator parts, we can't be of much assistance, but it is possible that such pictures may be obtained from the parts manufacturers with whom you deal.

COMMERCIAL REFRIGERATION

How to Keep Beer Lines Cool



The above sketch demonstrates the method suggested by Mr. Askin for keeping beer at the proper temperature between the keg and the faucet.

* * *

Askin Describes Method for Holding Beer At Proper Temperature from Keg to Tap

By Joe Askin, Chief Engineer, Fedders Mfg. Co.

MOST important precaution necessary in the brewing of good beer is sanitation, according to most brewmasters. The most important requirement in the storage and the dispensing of good beer is proper refrigeration.

Beer is made of barley, hops or other grains, which have gone through the process of fermentation. After fermentation has ceased, the beer must be kept in cold storage until it is ready to be racked off into kegs.

If the beer were not kept in cold storage, further fermentation would result in souring and spoilage of the beer. In this respect beer is almost as sensitive as milk and must be just as carefully handled as milk.

The brewers, the dispensers, and the public in general are becoming educated to the fact that keg beer must be kept at a temperature below 40° F. in order to maintain the quality of the beer as it leaves the brewery.

In some beer cooler installations the beer is refrigerated at the barrel end by keeping the kegs in a refrigerated cooler. In most installations the beer is refrigerated at the outlet end (the dispensing end) by one means or another.

In very few installations is the beer refrigerated between the outlet from the storage room and the dispensing end. The block tin beer line between these two ends, however, has been grossly neglected. It is with the end in view of eliminating this weakness in present day beer dispensing design that we wish to propose a new design, one which will be simple, foolproof and low in cost.

This design is shown in the above drawing, and consists of the following:

(1) A cold storage room in which the beer kegs are kept. This room is cooled by means of a unit cooler connected to a condensing unit placed on the right hand side outside of the refrigerator.

(2) Beer kegs are tapped in the refrigerated room and air pressure is supplied by an air compressor placed on the left hand side outside of the refrigerator.

(3) Block tin beer lines running *directly* from the *kegs* to the *faucets* in the bar placed in the room above the refrigerator. The block tin beer pipes are encased in a 3-in. flue pipe which is insulated on the outside.

(4) The back end of the faucets, where the block tin beer pipes are connected, is also encased in an insulated metal box.

Circulation in Flue Pipes

(5) Another 3-in. flue pipe, which is insulated, is connected to the box at the back end of the faucets and runs parallel to the other flue pipe down to a small blower and motor assembly placed on a shelf outside of the refrigerator. The outlet from this blower leads into the refrigerator through a hole in the wall.

The circulation of the cold air through the flue pipes and in the refrigerator is shown above. This circulation of cold air through the flue pipes results in refrigerated beer lines and faucets at all times. The increase in heat load on the refrigerator is negligible and the cost of operation is low as the blower motor has a load of only 28 watts.

Circulation of the cold air in the refrigerator is also shown above.

With a single flue which acts as both outlet and return to the refrigerator, a partition is placed in the middle and the flue pipe sections are assembled with this partition matched all the way.

There are many distinct advantages to this beer dispensing system.

(a) The length of block tin pipe through which the beer must pass between the keg and faucet is reduced to a minimum, inasmuch as there is no "cooling coil."

(b) The cost is low in comparison with other systems.

(c) The present habit of drawing off six to 10 glasses of beer in the morning and wasting this beer, is eliminated. No waste is necessary at any time. Waste in-between rush periods, due to drawing off a glass or two and pouring down the sewer, is eliminated.

(d) There is no "wild beer," as the short length of coil eliminates this constant complaint.

(e) The beer may be drawn off with more uniform foam control as the keg pressure may be kept lower. One glass will be like another, all having nice small bubbles of carbonic gas instead of large bubbles of carbonic gas mixed with air. This results in a creamier glass of beer, and, in turn, increased sales.

Drug Store Installation Employs Lipman Units

KIRKWOOD, Mo.—Two model 152 Lipman refrigerating machines were installed recently in the Kirkwood Drug Co. here—one unit to take care of a Taylor counter-type ice cream freezer and the other of a soda fountain, back bar, and meat box. Installation was made by the Supremo Heater Co., St. Louis dealer for General Refrigeration Sales Co.

Walling to Supervise York Branch Commercial Sales

LOS ANGELES—Charles Walling has been appointed supervisor of the commercial division of the Los Angeles branch of York Ice Machinery Corp. Mr. Walling was formerly connected with General Refrigeration Co. at Kansas City.

McCray Introduces New Display Cases

KENDALLVILLE, Ind.—Improvements and refinements characterize the three new models which McCray Refrigerator Sales Corp. has added to its line of commercial display cases for 1936.

Leading the trio is the new D-8 double-duty delicatessen case, which replaces the L-8 case which the company manufactured last year. The D-8 has the McCray method of concealed exterior lighting along its front, and is designed, exteriorally, along the lines of McCray's 310 case.

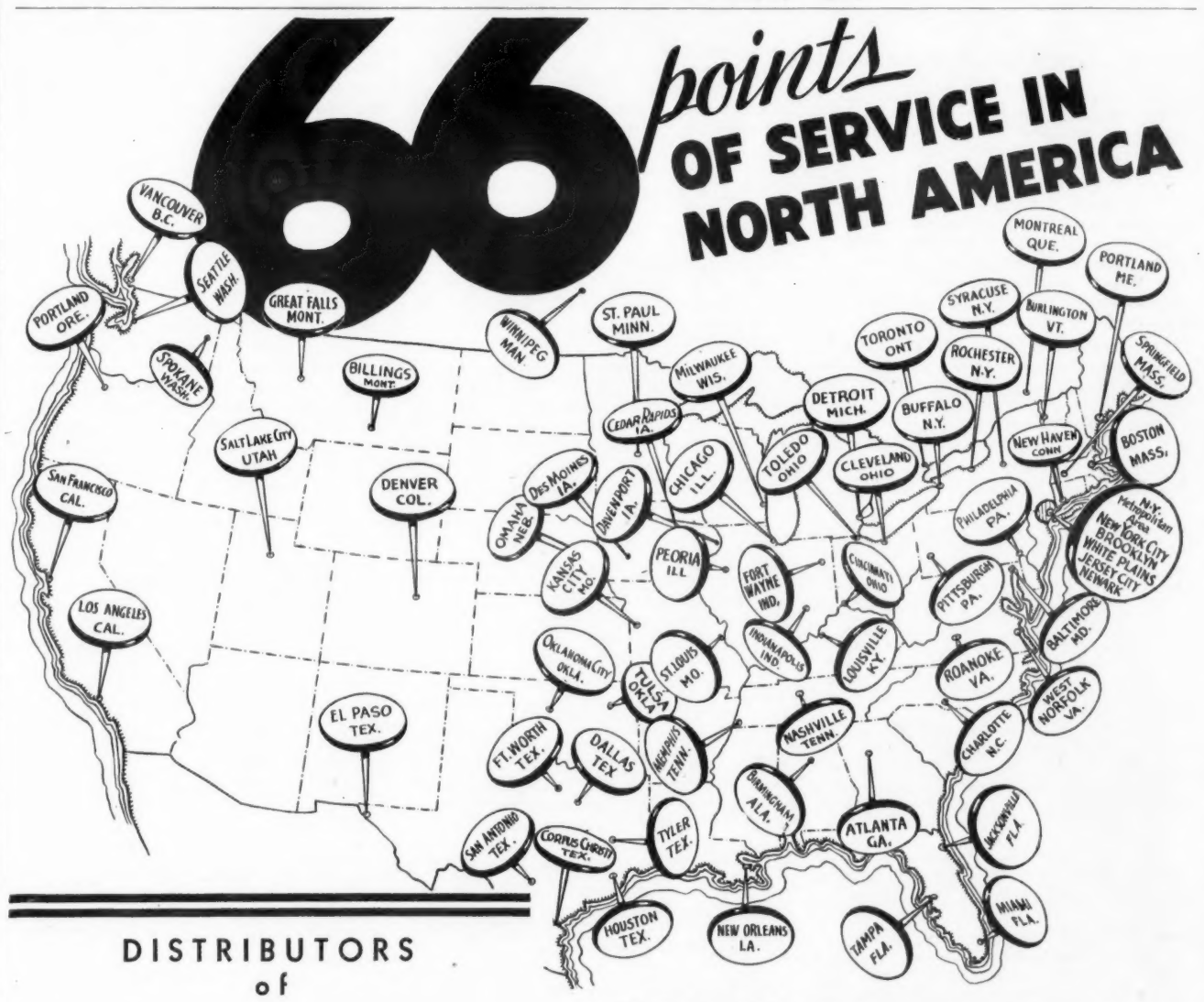
Exterior front, top, and ends are of white porcelain, with black trim and base. The entire back is of black metal. The case is built for electric refrigeration in both the display and storage compartments. It is equipped with an overhead coil in the display compartment, and a booster coil in the upper front storage space.

The case is designed to fill the market need in delicatessen shops, smaller food stores, or as an auxiliary case in larger stores. It is 8 ft. long, 35½ in. deep, and 54 in. high.

Second new case is the 310-DS. This, like the model 310-DD, is built for double duty, both display and storage, but differs from the latter in that the compressor is not supplied as an integral part. Complete diffusion coil equipment is included in the case, which may be used with a remote installation of the machine.

The new McCray model 4 is a fish and poultry case, and is a new departure in the line. In general exterior appearance, it harmonizes with the McCray model 1510 case.

Lighting arrangement is the same as in other models. Front, top, and ends of the case are of white porcelain with black base and trim, and the back is of oak, finished in silver-gray.



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Billings, Mont., Midland Implement Co.
Birmingham, Ala., Harris Transfer & Whse. Co.
Boston, Mass., Virginia Smelting Co.
Brooklyn, N. Y., Perry Metal Products Co., Inc.
Buffalo, N. Y., Rolls Chemical Co.
Burlington, Vt., G. S. Blodgett Co.
Cedar Rapids, Iowa, Colders Transfer & Storage Co.
Charlotte, N. C., Henry V. Dick & Co.
Chicago, Ill., Innis, Speiden & Co.
Cincinnati, Ohio, Williams & Co., Inc.
Cleveland, Ohio, Innis, Speiden & Co.
Corpus Christi, Texas, Electric Sales Co.
Dallas, Texas, Beckett Elec. Co., Inc.; Dallas Transfer & Terminal Whse. Co.
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Des Moines, Iowa, Merchants Transfer & Storage Co.
Detroit, Mich., W. C. Dever; Central Detroit Whse. Co.
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Fort Worth, Texas, Baker Ice Machine Co.
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Milwaukee, Wis., Globe Refrigerator Co.
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Newark, N. J., T. W. Binder
New Haven, Conn., Smedley Co.
New Orleans, La., Bartlett Chemicals, Inc.
New York, N. Y., Virginia Smelting Co.; National Air Conditioning Co.; Lehigh Harlem River Terminal Whse.
Oklahoma City, Okla., G. S. Robins & Co.; O.K. Trans. & Storage Co.
Omaha, Neb., Gordon Storage Warehouses, Inc.
Peoria, Ill., Isaac Walker Hdw. Co.
Philadelphia, Pa., M. & E. Refrigeration Accessories Co.; Merchants Warehouse Co.
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Portland, Ore., C. F. Miller & Co.
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Rochester, N. Y., Rolls Chemical Co., c/o Upton Cold Storage Co.
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Tulsa, Okla., Nichols Transfer & Storage Co.
Tyler, Texas, Walter Connolly
West Norfolk, Va., Virginia Smelting Co.
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Montreal, Quebec, Canada, Bruce Ross, Ltd., c/o Pigment & Chemical Co., Ltd.
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Vancouver, B. C., Can., Shanahan Chemicals, Ltd.
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VIRGINIA Refrigerants—recognized as superior by service men everywhere—are stocked at so many convenient distribution points that prompt delivery is assured.

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A refrigerant of comparatively low boiling point (–10.6°F); free from moisture and acidity, and of uniform quality. Suitable for use with flange-jointed copper tubing.

The services of our consulting department are available, without charge, for solution of refrigeration problems.

Virginia Smelting Co.
West Norfolk Virginia

Mail this coupon NOW!

F. A. Eustis, Sec'y, Virginia Smelting Co., 131 State St., Boston, and 76 Beaver St., New York ERN-11-13-35

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COMMERCIAL REFRIGERATION

Standard Testing Methods for Mechanical Condensing Units

Editor's Note: Published on this page and the page opposite are six standard tests for mechanical condensing units. These tests have been adopted as standard by the Refrigerating Machinery Association and the Refrigeration Division of the National Electrical Manufacturers Association. The first 10 provisions of the testing methods and the rating standards were published on pages 17 and 18 of the Nov. 6 issue of ELECTRIC REFRIGERATION NEWS.

Secondary Refrigerant Calorimeter Method

XI. Secondary Refrigerant Calorimeter Method.

a. Description.

(1) The secondary refrigerant calorimeter shall consist of a direct expansion coil or series of coils in parallel serving as a primary evaporator. This evaporator is suspended in the upper part of a pressure tight vessel and arrangements are made to supply heat to the liquid.

(2) The refrigerant control may be of either the hand regulated or the automatic expansion valve type and should be located close to the calorimeter. The control and the refrigerant line to the calorimeter should be insulated to minimize loss of refrigeration.

(3) The calorimeter shall be insulated in such a manner that the heat leakage will not be greater than 5 per cent of the capacity of the condensing unit.

(4) Means shall be provided to obtain the pressure of the calorimeter secondary refrigerant. The gauge used for this purpose shall be such that it can be accurately read to within 0.5 lb. per square inch.

(5) The calorimeter shall be equipped with a safety switch which will stop the flow of heat into the secondary refrigerant at a predetermined pressure.

b. Calibration.

(1) The heat leakage of the calorimeter shall be determined by adjusting the heat input to the secondary refrigerant to a rate sufficient to maintain the secondary refrigerant at a pressure corresponding to approximately 25° F. above the ambient. The ambient temperature shall be held constant within plus or minus 2° F. at any desired value not exceeding 90° F. The heat input to the secondary refrigerant shall be maintained constant, and pressure readings shall be taken at one hour intervals and continued until four successive values of saturated temperature do not differ by more than 1° F.

(2) The heat coefficient is given by:

$$q_1 = \frac{Q_h}{t_s - t_a}$$

q_1=calorimeter heat leakage coefficient in B.t.u. per hour per degree F. difference.

Q_h=calorimeter heat input in B.t.u. per hour.

t_a=ambient temperature in degrees F.

t_s=saturated secondary refrigerant temperature in degrees F.

(3) The heat leakage is given by:

$$Q_1 = q_1 (t_a - t_s)$$

q_1=heat leakage coefficient in B.t.u. per hour per degree F. difference.

Q_1=heat leakage into calorimeter in B.t.u. per hour.

t_a=ambient temperature around the calorimeter in degrees F.

t_s=saturated secondary refrigerant temperature in degrees F.

(4) This method is recommended, but the calorimeter may be calibrated for heat leakage by any other equivalent method.

c. Procedure.

(1) The specified suction pressure at the condensing unit is adjusted by means of the refrigerant control, and the specified temperature of the suction vapor at the condensing unit is adjusted by varying the heat input to the secondary refrigerant.

(2) The calorimeter data to be recorded after the condensing unit rating specified conditions have become established are as follows:

(a) Pressure of refrigerant vapor at evaporator outlet; (b) temperature of refrigerant vapor at evaporator outlet; (c) pressure of liquid refrigerant entering refrigerant control; (d) temperature of liquid refrigerant entering refrigerant control; (e) ambient temperature at calorimeter; (f) pressure of secondary refrigerant; (g) heat input to secondary refrigerant.

(3) All readings shall be taken every 20 minutes.

(4) Tests shall be continued until four successive readings are within the allowable limits given in Section 6 and the variation in heat input to the calorimeter during the test shall not be great enough to cause an error of more than 1 per cent in condensing unit capacity.

Calculation of Capacity

d. Calculations.

(1) The capacity of the condensing unit shall be determined from the following:

$$Q = \frac{h_{g1} - h_{f1}}{h_{g2} - h_{f2}} (Q_h + Q_1)$$

h_{f1}=heat content of the refrigerant liquid leaving the condensing unit in B.t.u. per pound.

h_{f2}=heat content of the refrigerant liquid entering the refrigerant control in B.t.u. per pound.

h_{g1}=heat content of the refrigerant vapor entering the condensing unit, under conditions specified in the ASRE Standard Method of Rating Condensing Units in B.t.u. per pound.

h_{g2}=heat content of the refrigerant leaving the calorimeter in B.t.u. per pound.

Q=condensing unit capacity in B.t.u. per hour.

Q_h=calorimeter heater input in B.t.u. per hour.

Q_1=calorimeter heat leakage gain in B.t.u. per hour.

Flooded System Primary Refrigerant Calorimeter Method

XII. Flooded System Primary Refrigerant Calorimeter Method.

a. Description.

(1) The flooded system primary refrigerant calorimeter shall consist of a pressure tight vessel or vessels in parallel, containing liquid refrigerant to which heat is supplied by heating elements in direct thermal contact with the liquid refrigerant.

(2) The refrigerant control may be of either the hand regulated or the automatic expansion valve type and should be located close to the calorimeter. The control and the refrigerant line to the calorimeter should be insulated to minimize loss of refrigeration.

(3) The calorimeter shall be insulated in such a manner that the heat leakage will not exceed 5 per cent of the capacity of the condensing unit.

Calibration of Calorimeter

b. Calibration of the calorimeter may be performed by either the heat absorption method or the small condensing unit method. These shall be carried out as follows:

(1) Heat absorption method:

(a) The calorimeter shall be filled with liquid refrigerant to its normal operating level, and the liquid inlet and vapor outlet stop valves shall be closed. Holding the ambient temperature constant within plus or minus 2° F. at any desired value not exceeding 90° F., supply enough heat to maintain a temperature approximately 25° F. above the ambient. The heat input to the refrigerant shall be maintained constant, and pressure readings shall be taken at one hour intervals and continued until four successive values of saturated temperature do not differ by more than 1° F.

(b) The heat leakage coefficient is given by:

$$q_1 = \frac{Q_h}{t_r - t_a}$$

Q_h=calorimeter heat input in B.t.u. per hour.

q_1=calorimeter heat leakage coefficient in B.t.u. per hour per degree F. difference.

t_a=average ambient temperature around the calorimeter in degrees F.

t_r=saturated refrigerant temperature in degrees F.

(2) Small condensing unit method.

(a) With the calorimeter in a 90° F. ambient and no load applied other than heat leakage, a small condensing unit is operated until steady conitions are reached. Then the condensed liquid refrigerant is collected and measured in volume measuring vessels by the method of section 13 over a period of time sufficient to accumulate not less than a 6-in. height of liquid in the measuring vessel.

(b) The heat leakage coefficient is given by:

$$q_1 = \frac{V_d (h_{g2} - h_{f2})}{t_a - t_r}$$

$_d$=density of liquid refrigerant, for the temperature at which flow is measured in pounds per cubic foot.

h_{f2}=heat content of refrigerant liquid entering the refrigerant control in B.t.u. per pound.

h_{g2}=heat content of the refrigerant vapor leaving the calorimeter in B.t.u. per pound.

q_1=calorimeter heat leakage coefficient in B.t.u. per hour per degree F. difference.

t_a=average ambient temperature around the calorimeter in degrees F.

t_r=saturated refrigerant temperature in degrees F.

V=flow of liquid refrigerant in cubic feet per hour.

(3) The heat leakage is given by:

$$Q_1 = q_1 (t_a - t_r)$$

Q_1=heat leakage into calorimeter in B.t.u. per hour.

q_1=heat leakage coefficient in B.t.u. per hour per degree F. difference.

t_a=average ambient temperature around the calorimeter in degrees F.

t_r=saturated refrigerant temperature in degrees F.

(4) These methods are recommended, but the calorimeter may be calibrated for heat leakage by any other equivalent method.

Procedure in Test

c. Procedure.

(1) The specified suction pressure at the condensing unit is adjusted by means of the refrigerant control, and the specified temperature of the suction vapor at the condensing unit is adjusted by varying the heat input to the calorimeter.

(2) Calorimeter data to be recorded after the condensing unit rating specified conditions have become established are as follows:

(a) Pressure of refrigerant vapor at evaporator outlet; (b) temperature of refrigerant vapor at evaporator outlet; (c) pressure of liquid refrigerant entering refrigerating control; (d) temperature of liquid refrigerant entering refrigerant control; (e) ambient temperature at calorimeter; (f) calorimeter heater input.

(3) All readings shall be taken every 20 minutes.

(4) Test shall be continued until four successive readings are within the allowable limits given in Section 6 and the variation in heat input to the calorimeter during the test shall not be great enough to cause an error of more than 1 per cent in condensing unit capacity.

d. Calculations.

(1) The capacity of the condensing unit shall be determined from the following:

$$Q = \frac{h_{g1} - h_{f1}}{h_{g2} - h_{f2}} (Q_h + Q_1)$$

h_{f1}=heat content of the refrigerant liquid leaving the condensing units in B.t.u. per pound.

h_{f2}=heat content of the refrigerant liquid entering the refrigerant control in B.t.u. per pound.

h_{g1}=heat content of the refrigerant vapor entering the condensing unit, under the conditions specified in the ASRE Standard Method of Rating Condensing Units in B.t.u. per pound.

h_{g2}=heat content of the refrigerant leaving the calorimeter in B.t.u. per pound.

Q=condensing unit capacity in B.t.u. per hour.

Q_h=calorimeter heater input in B.t.u. per hour.

Q_1=calorimeter heat leakage gain in B.t.u. per hour.

Dry System Primary Refrigerant Calorimeter Method

XIII. Dry System Primary Refrigerant Calorimeter Method.

a. Description.

(1) The dry system primary refrigerant calorimeter is similar to the system described under XII except that a dry type evaporator is used and the necessary modifications in procedure are made to develop the full accuracy of this method.

(2)The dry system primary refrigerant calorimeter shall consist of a series of pressure tight tubular vessels of suitable length and diameter for accomplishing the evaporation of the refrigerant circulated by the condensing unit on test. The tubular vessels shall be electrically isolated and equipped with electrical heating means such as, tube-type electric heaters within the tubular vessels, wire type heaters wound about the tubular vessels, heaters thermally well bonded to the tubular vessels, or the heating may be accomplished by passing current through the tubular vessels themselves, utilizing the heat thus generated to evaporate the refrigerant.

(3) The refrigerant control may be of either the hand regulated or the automatic expansion valve type and should be located close to the calorimeter. The control and the refrigerant line to the calorimeter shall be insulated to minimize loss of refrigeration.

(4) The calorimeter shall be insulated in such a manner that the heat leakage does not exceed 5 per cent of the capacity of the condensing unit.

(5) The surface of the pressure vessels and of the electrical insulation of the heaters if they are external to the pressure vessels and of bonding material when bonding material is used, shall be supplied with at least ten equally spaced temperature measuring devices for determining the mean surface temperature.

b. Calibration.

(1) Calibration of the calorimeter shall be performed by supplying enough heat to it to raise the temperature of the evaporator surface about 25° F. above the ambient. When internally located heaters are used, the evaporator shall be filled with refrigerating machine oil to serve as a heat transfer medium. In this case the oil shall be thoroughly cleaned out after the calibration. The ambient temperature shall be held constant within plus or minus 2° F. at any desired value not exceeding 90° F. The heat input to the calorimeter shall be maintained constant, and temperature readings shall be taken at one hour intervals and continued until four successive averages do not differ by more than 1° F.

(2) The heat leakage coefficient is given by:

$$q_1 = \frac{Q_h}{t_c - t_a}$$

Q_h=calorimeter heat input in B.t.u. per hour.

q_1=calorimeter heat leakage coefficient in B.t.u. per hour per degree F. difference.

t_a=average ambient temperature around the calorimeter in degrees F.

t_c=average surface temperature of tubes, and heaters if externally located, in degrees F.

(3) The heat leakage is given by:

$$Q_1 = q_1 (t_a - t_c)$$

q_1=heat leakage coefficient in B.t.u. per hour per degree F.

Q_1=heat leakage into calorimeter in B.t.u. per hour.

t_a=average ambient temperature around the calorimeter in degrees F.

t_c=average surface temperature of tubes, and heaters if externally located, in degrees F.

Test Procedure

c. Procedure.

(1) The specified suction pressure at the condensing unit is adjusted by means of the refrigerant control, and the specified temperature of the suction vapor at the condensing unit is adjusted by varying the heat input to the calorimeter.

(2) Calorimeter data to be recorded after the condensing unit rating specified conditions have become established are as follows:

(a) Pressure of refrigerant vapor at evaporator outlet; (b) temperature of refrigerant vapor at evaporator outlet; (c) pressure of liquid refrigerant entering refrigerant control; (d) temperature of liquid refrigerant entering refrigerant control; (e) ambient temperature at calorimeter; (f) calorimeter heater input; (g) mean surface temperature of tubes, and heaters if externally located.

(3) All readings shall be taken every 20 minutes.

(4) Test shall be continued until four successive readings are within the allowable limits given in Section 6 and the variation in heat input to the calorimeter during the test shall not be great enough to cause an error of more than 1 per cent in condensing unit capacity.

d. Calculations.

(1) The capacity of the condensing unit shall be determined from the following:

$$Q = \frac{h_{g1} - h_{f1}}{h_{g2} - h_{f2}} (Q_h + Q_1)$$

h_{f1}=heat content of the refrigerant liquid leaving the condensing unit in B.t.u. per pound.

h_{f2}=heat content of the refrigerant liquid entering the refrigerant control in B.t.u. per pound.

h_{g1}=heat content of the refrigerant vapor entering the condensing unit, under the conditions specified in the ASRE Standard Method of Rating Condensing Units in B.t.u. per pound.

h_{g2}=heat content of the refrigerant leaving the calorimeter in B.t.u. per pound.

Q=condensing unit capacity in B.t.u. per hour.

Q_h=calorimeter heater input in B.t.u. per hour.

Q_1=heat leakage into calorimeter in B.t.u. per hour.

Liquid Refrigerant Quantity Method

XIV. Liquid Refrigerant Quantity Method.

a. Description.

(1) The apparatus for measuring liquid refrigerant volume shall consist of two vertical pressure vessels (about 4 ft. high) connected in parallel by horizontal headers at the top and bottom and shall have shut-off valves between the headers and vessels on the lines entering and leaving each vessel. The vessels and their connections from the condensing unit shall be thermally insulated. The pressure is equalized at all times by means of a small gas line connecting the tops of the two vessels. Recommended sizes of vessels are given in Table 1.

* * *

Table 1

Vessel Diameter	Vessel Length	Range of Use	Refrigerant
4 in.	4 ft.	0 to 2 tons	Freon
4 in.	4 ft.	0 to 2 tons	Sulphur Dioxide
4 in.	4 ft.	0 to 2 tons	Methyl Chloride
4 in.	4 ft.	2 to 7½ tons	Ammonia
8 in.	4 ft.	2 to 10 tons	Freon
8 in.	4 ft.	2 to 10 tons	Sulphur Dioxide
8 in.	4 ft.	2 to 10 tons	Methyl Chloride
8 in.	4 ft.	7½ to 40 tons	Ammonia
12 in.	4 ft.	10 to 25 tons	Freon
12 in.	4 ft.	10 to 25 tons	Sulphur Dioxide
12 in.	4 ft.	10 to 25 tons	Methyl Chloride

* * *

(2) The liquid refrigerant line leaving each vessel shall be equipped with a temperature measuring instrument well.

(3) Each vessel shall be fitted with a graduated gauge glass covering approximately the entire length.

(4) A valve shall be located in the liquid refrigerant line from the con-

(Concluded on Page 11, Column 1)

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Condensing Unit Testing Methods

(*Concluded from Page 10, Column 5*)

densing unit receiver to the calibrating vessels to regulate the flow of liquid and maintain the normal operating level in the receiver.

b. Calibration.

(1) Each measuring vessel shall be calibrated with a liquid of known density and the gauge glass scales marked in accordance with the calibration.

(2) Calibrations are recommended, for various sizes of vessels, as follows: 4-in. diameter, in hundredths (1/100) cu. ft.; 8-in. diameter, in tenths (1/10) cu. ft.; 12-in. diameter, in fourths (¼) cu. ft.

How Test Is Made

c. Procedure.

(1) Measurement of the flow of liquid refrigerant is made by timing the interval for the collection of a volume of liquid for a period of not less than two minutes. The diameter of the vessel used should be such that the height of liquid refrigerant accumulated is not less than 6 in. This volume is collected from the condensing unit by closing the outlet valve on the collecting vessel and the inlet valve on the other vessel which then continues the supply of refrigerant to the refrigerant control. Care must be taken to start timing after a steady flow is established and to finish timing before the level in the vessel supplying the refrigerant control falls to a point which breaks the liquid seal at the outlet. Timing shall be recorded on the vessel in which the liquid level is rising. The total volume of the liquid refrigerant in the two vessels must be constant within 1 per cent at all times during the test. This total volume shall be determined by a simultaneous reading of the liquid levels in both vessels.

(2) The data to be recorded after unit rating specified conditions have become established are as follows:

(a) Time for collection of liquid refrigerant volume; (b) temperature of liquid refrigerant in collecting vessel; (c) volume of liquid refrigerant collected.

(3) All readings should be taken every 20 minutes.

(4) Test shall be continued until four successive readings are within the allowable limits given in Section 6 and the variation in rate of liquid refrigerant flow during the test shall not be great enough to cause an error of more than 1 per cent in condensing unit capacity.

(5) A sample of the liquid refrigerant shall be taken to determine the proportion of oil present.

Method of Figuring Results

d. Calculation.

(1) The capacity of the condensing unit shall be determined from the following:

$$Q=V_d[(1-0.018\,wd)\,(h_{g1}-h_{f1})-0.44w\,(t_{f1}-t_{g1})]$$

$_d$=density of liquid refrigerant, for the temperature at which flow is measured, in pounds per cu. ft.

h_{f1}=heat content of the refrigerant liquid leaving the condensing unit in B.t.u. per pound.

h_{g1}=heat content of the refrigerant vapor entering the condensing unit, under the conditions specified in the ASRE Standard Method of Rating Condensing Units, in B.t.u. per pound.

Q=condensing unit capacity in B.t.u. per hour.

t_{f1}=temperature of the refrigerant liquid leaving the condensing unit in degrees F.

t_{g1}=temperature of the refrigerant vapor entering the condensing unit, under the conditions specified in the ASRE Standard Method of Rating Condensing Units, in degrees F.

V=flow of mixture of the liquid refrigerant and oil in cu. ft. per hour.

w=weight of oil per unit weight of mixture of the liquid refrigerant and oil.

Liquid Refrigerant Quantity Meter and Flow Meter Methods

XV. Liquid Refrigerant Quantity Meter and Flow Meter Methods.

a. Description.

(1) The liquid refrigerant meter may be either a quantity meter which consists of a metering mechanism accurate to within 1 per cent which records the flow on a suitable counter graduated in gallons or cu. ft., or a flowmeter which consists of a mechanism with suitable supplementary devices for determining the instantaneous rate of flow of the liquid refrigerant in cu. ft. or gallons per hour.

(2) The liquid refrigerant quantity meter shall be connected in the liquid line between the liquid receiver outlet and the refrigerant control.

(3) In order that the meter may function properly under all conditions and that it may be protected from abuse and low refrigerant charge, additional apparatus shall be provided, preferably as an integral part of the quantity meter assembly, as follows:

(a) Subcooling coil ahead of the meter sufficient to prevent vaporization of refrigerant through the meter; (b) sight glasses shall be located immediately before the subcooling coil and just beyond the meter to determine that vapor bubbles are not mixed with the liquid refrigerant; (c) bypass valve and tube for bypassing the liquid around the meter. This valve shall be open except when data are being recorded; (d) thermometer and well for measuring the liquid refrigerant temperature prior to its entering the subcooling coil; (e) thermometer and well for measuring the temperature at which the liquid refrigerant enters the meter; (f) pressure gauge connected to the outlet side of the meter.

(4) The calorimeter and its supply of heat load should be such as to balance out quickly and require little adjustment.

(5) A supply of cold water at reasonably constant pressure and temperature together with a regulating valve should be provided for the meter subcooling coil.

Calibration of Meter

b. Calibration.

(1) The meter shall be calibrated periodically.

(2) The testing fluid used in calibrating the meter shall have an absolute viscosity not less than one-half nor more than twice that of the liquid refrigerant whose quantity it normally measures.

(3) Meter shall be calibrated at not less than three rates of flow covering the capacity range used.

c. Procedure.

(1) With the meter bypass valve open, start the condensing unit. After the condensing unit rating specified conditions have become established, prepare for the test as follows:

(a) Close the meter bypass valve;

(b) Keep the liquid refrigerant subcooled at least 5° F. below its saturation temperature at the outlet from the flow meter.

(2) After the above specified conditions have been obtained, record data on the meter and cooling units as follows:

(a) Meter reading; (b) saturation temperature of the refrigerant determined from the gauge connected to the outlet side of the meter; (c) temperature of the liquid entering the subcooling coil; (d) temperature of the liquid entering the meter.

(3) All readings should be taken every 10 minutes.

(4) Test shall be continued until seven successive readings are within the allowable limits given in Section 6 and the variation in rate of liquid refrigerant flow during the test shall not be great enough to cause an error of more than 1 per cent in condensing unit capacity.

(5) A sample of the liquid refrigerant shall be taken to determine the proportion of oil present.

d. Calculations.

The condensing unit capacity shall be determined from the following:

$$Q=V_d[1-0.018\,wd)\,(h_{g1}-h_{f1})-0.44\,w\,(t_{f1}-t_{g1})]$$

$_d$=density of liquid refrigerant, for the temperature at which flow is measured in pounds per cu. ft.

h_{g1}=heat content of the refrigerant vapor entering the condensing unit under the conditions specified in the ASRE Standard Method of Rating Condensing Units in B.t.u. per pound.

h_{f1}=heat content of the refrigerant liquid leaving the condensing unit in B.t.u. per pound.

Q=condensing unit capacity in B.t.u. per hour.

t_{f1}=temperature of the refrigerant liquid leaving the condensing unit in degrees F.

t_{g1}=temperature of the refrigerant vapor entering the condensing unit, under the conditions specified in the ASRE Standard Method of Rating Condensing Units, in degrees F.

V=flow of mixture of the liquid refrigerant and oil in cu. ft. per hour.

w=weight of oil per unit weight of mixture of the liquid refrigerant and oil.

Condenser Water Method

XVI. Condenser Water Method.

a. Description.

(1) The condenser is that which forms a part of the water cooled condensing unit being tested. The calorimeter completes the equipment needed except for the provisions that must be made for taking the readings listed in paragraph c below.

(2) This method shall be used *only* when the calculated heat leakage from the condenser to the 90° F. ambient is *less than 2 per cent* of the refrigerating effect of the condensing unit.

b. Calibration.

None.

c. Procedure.

(1) During the primary test record shall be made of the following:

(a) Pressure of vapor refrigerant entering condenser; (b) temperature of vapor refrigerant entering condenser; (c) pressure of liquid refrigerant leaving condenser; (d) temperature of liquid refrigerant leaving condenser; (e) temperature of water entering condenser; (f) temperature of water leaving condenser; (g) ambient temperature surrounding condenser; (h) quantity of condenser cooling water; (i) average temperature of external condenser surface exposed to ambient.

(2) All readings shall be taken concurrently and at the same time intervals specified in the primary test, and shall be continued until four successive readings are within the allowable limits given in Sections 4 and 6 and the variation in condensing water temperature to rise and rate of flow during the test shall not be great enough to cause an error of more than 1 per cent in condensing unit capacity.

d. Calculations.

(1) The capacity of the condensing unit shall be calculated as follows:

$$Q=\frac{h_{g1}-h_{f1}}{h_{g3}-h_{f3}}[W\,(t_2-t_1)+Q_n]$$

h_{f1}=heat content of refrigerant liquid leaving condensing unit in B.t.u. per pound.

h_{f3}=heat content of refrigerant liquid leaving the condenser in B.t.u. per pound.

h_{g1}=heat content of refrigerant vapor entering condensing unit, under the conditions specified in the ASRE Standard Method of Rating Condensing Units in B.t.u. per pound.

h_{g3}=heat content of refrigerant vapor entering condenser in B.t.u. per pound.

Q=condensing unit capacity in B.t.u. per hour.

Q_n=heat loss from condenser to surrounding air in B.t.u. per hour, $S\,U_a\,(t_c-t_a)$ approximately.

S=outside surface of condenser in sq. ft.

t_a=ambient temperature in degrees F.

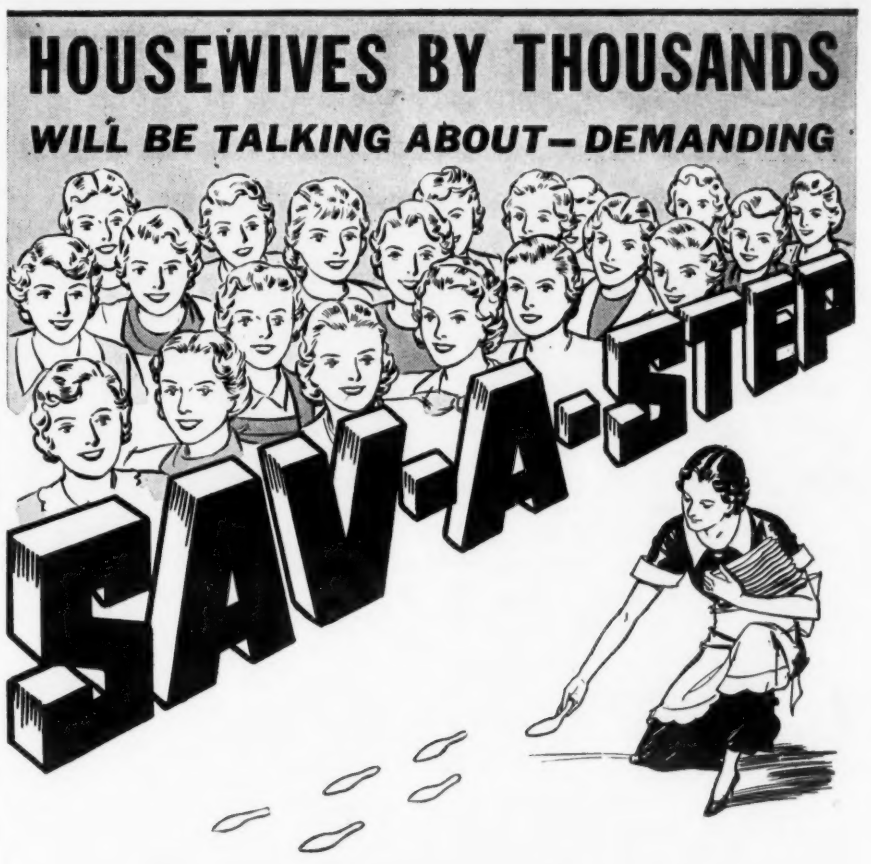
t_c=external surface temperature of condenser in degrees F.

t_1=condenser entering water temperature in degrees F.

t_2=condenser leaving water temperature in degrees F.

U_a=air film heat transfer coefficient, B.t.u. per hour per sq. ft. per degree F.

W=flow of condenser cooling water in pounds per hour.



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Article 1
General Provisions

Sec. 1. Definitions:

Unless otherwise expressly stated, whenever used in this chapter the following terms shall respectively be deemed to mean:

33. Refrigerating system: A combination of apparatus in which a refrigerant is contained and may be circulated for the purpose of extracting heat.

(a) The parts of the system are the compressor, generator, condenser, absorber, receiver, shell type or tube type apparatus, evaporator, piping, vessels, or other parts, containing a refrigerant.

(b) Direct method of refrigeration: A system in which the evaporator is located in the material or space refrigerated or in air circulating duct or ducts communicating with such space.

(c) Indirect open spray method of refrigeration: A system in which a liquid as brine or water cooled by an evaporator external to a material or air cooling chamber is circulated to such material and/or air cooling chamber through spray or sprays.

(d) Indirect closed surface method of refrigeration: A system in which a liquid as brine or water cooled by an evaporator external to a material or air cooling chamber is circulated to such material and/or air cooling chamber through pipes or other closed surfaces.

(e) Double indirect open spray method of refrigeration: A system in which a liquid as brine or water cooled by an evaporator further cools, without direct contact, brine or water in another vessel external to a material and/or air cooling chamber, which second brine or water is then circulated to such material and/or air cooling chamber through spray or sprays.

(f) Double indirect closed surface method of refrigeration: A system in which a liquid as brine or water cooled by an evaporator further cools, without direct contact, brine or water in another vessel external to a material and/or air cooling chamber, which second brine or water is then circulated to such material and/or air cooling chamber through pipes or other closed surfaces.

(g) Unit system refrigerator: A refrigerator box or water cooler containing in it and/or on it an entire refrigerating system for making ice and/or cooling water and/or other substances, which box or water cooler with its refrigerating system for making ice and/or cooling without disconnecting any refrigerant containing parts.

(h) Unit system air conditioner: A refrigerating system for the cooling of air, which may be removed from the premises without disconnecting any refrigerant containing parts.

(i) Refrigerating system of sealed type: A refrigerating system which does not depend upon moving surfaces for the retention of refrigerant and which will not develop a refrigerant leak when subjected to a temperature of 700° F. for 30 minutes in an oven, when the system is fitted with a temporary device to relieve excess pressure over 300 lbs. per sq. in.

(j) Refrigerant is the substance other than brine or water used to produce refrigeration.

(k) Hydrocarbon refrigerant: Any refrigerant composed exclusively of hydrogen and carbon.

(l) Non-irritant refrigerant: Any refrigerant which when breathed does not attack the throat or lungs and is a non-toxic refrigerant. A non-toxic refrigerant is any refrigerant which is of a lower degree of toxicity than Group 4 as defined on page 106 under Summary of Underwriters' Laboratories Report MH-2375 entitled "The Comparative Life, Fire, and Explosion Hazards of Common Refrigerants." (Note—Copies of this report are on file in the New York Public Library and Municipal Library of the City of New York).

(m) Irritant refrigerant: Any refrigerant that may not be classified as a non-irritant refrigerant, according to definition (l).

(n) Non-flammable refrigerant: A practically non-flammable refrigerant. For the purposes of classification as a practically non-flammable refrigerant it is required that the refrigerant shall not form, in the presence of a source of ignition, flammable mixtures with air at temperatures (initial) below 100° F. and at higher temperatures shall form, if any, only weakly combustible mixtures. (See Underwriters' Laboratories Method for the Classification of the Hazards of Liquids—March, 1929).

(o) Flammable refrigerant: Any refrigerant that may not be classified as a practically non-flammable refrigerant, according to definition (n).

(p) Vented flame: Any flame from which the products of combustion are carried to the outside of a building by means of a conduit to a chimney or by a hood connected to a chimney or to the outside air.

(q) Brine: Any cooled liquid which is used for transmission of heat without a change of its state.

(r) Duct: A tube or conduit used for conveying air in an air-conditioning system:

(s) Piping: Pipe or tube mains for interconnecting the various parts of a refrigerating system.

(t) Pressure relief device: A pressure relief valve or a rupture member for relieving excess pressure.

(u) Pressure relief valve: A valve held closed by a spring or other means to automatically relieve pressure in excess of its setting.

(v) Fusible plug: A device having a predetermined temperature fusible member for the relief of pressure.

(w) Pressure limiting device: A pressure or temperature responsive mechanism for automatically stopping the operation of the pressure imposing element, in case of excess pressure.

(x) Pressure imposing element: That apparatus which draws the refrigerant from the low pressure or low temperature side of the system and discharges it into the high pressure or high temperature side of the system.

(y) Rupture member: A device that will automatically rupture at a predetermined pressure.

(z-1) Liquid receiver: A vessel permanently connected to a system by inlet and outlet pipes for storage of a liquid refrigerant.

(z-2) Evaporator: That part of a refrigerating system in which a refrigerant is vaporized to produce refrigeration.

(z-3) Refrigerating machinery room: A room in which is located a refrigerating system but not including evaporators when located in a cold storage room, refrigerator box, air-conditoned space, or other enclosed space.

(z-4) Department store: A building occupied by one tenant or more than one tenant under the same management, where more than 100 persons commonly assemble above the first floor for the purpose of buying personal wearables and other merchandise used in the home.

(z-5) Air conditioning: Cooling of air for human comfort by means of a refrigerating system and/or brine and/or water.

(z-6) Container: A cylinder for the shipment of refrigerant constructed to conform to the regulations of the interstate Commerce Commission.

Public buildings: Public buildings are buildings or parts of buildings in which persons congregate for civic, political, educational, religious or recreational purposes, or in which persons are harbored to receive medical, charitable or other care or treatment, or in which persons are held or detained by reason of public or civic duty, or for correctional purposes, including among others, court houses, schools, colleges, libraries, museums, exhibition buildings, lecture halls, churches, assembly halls, lodge rooms, dance halls, theaters, bath houses, hospitals, asylums, armories, fire houses, police stations, jails, and passenger depots.

Residence buildings: Residence buildings are buildings, or parts of buildings in which sleeping accommodations are provided except such as may for other reasons be classed as public buildings, including among others, dwellings, tenement houses, hotels, lodging houses, dormitories, convents, and studios and club houses having sleeping accommodations. **(Note**—the interpretation given this paragraph is that the names of certain types of buildings such as dwellings, tenement houses, hotels, etc., are illustrations of the type of building commonly classed as residence buildings, and that these names do not refer to buildings which are generally "for other reasons classed as public buildings.")

Business buildings: Business buildings are buildings or parts of buildings which are not public buildings or residence buildings, including among others, office buildings, stores, markets, restaurants, warehouses, freight depots, car barns, stables, garages, factories, laboratories, smoke houses, grain elevators, and coal pockets.

Mixed occupancy: In case a building is occupied or used for different purposes in different parts, the provisions of this chapter applying to each class of occupancy shall apply to such parts of the building as come within that class; and if there should be conflicting provisions, the requirements securing the greater safety shall apply.

Doubtful classification: In case any building is not specifically provided for, or where there is any uncertainty as to its classification, its status shall be fixed by a rule promulgated by the superintendent of buildings.

Article 3
Bonds and Fees

Sec. 43. Fees for Permits:

Applicants for permits under the provisions of this chapter shall pay annual fees for each refrigerating system, as follows:

35. Refrigerating Systems:

Each system containing over 1,000 lbs.	$20
Each system containing 100 to 1,000 lbs.	10
Each system containing 20 to 100 lbs.	5
Each system containing 6 to 20 lbs...	2
Each system containing less than 6 lbs.	1

Article 18
Refrigerating Systems

Section 216. Permits and Approvals.
Section 217. Supervision.
Section 218. Classifications.
Section 219. Permissible Locations.
Section 220. Refrigerating Machinery Rooms.
Section 221. Ventilation.
Section 222. Open Flames and Electrical Equipment.
Section 223. Testing.
Section 224. Piping, Tubing, Fittings, Supports, Charging, Air Ducts.
Section 225. Safety Devices.
Section 226. Operating Precautions.
Section 227. Illustrations of Methods of Refrigeration for Air Conditioning.

Sec. 216. Permits and Approval:

(a) No person shall maintain or operate a refrigerating system without a permit.

(b) A permit will not be required for a refrigerating system containing 6 lbs. or less of refrigerant, when located in the residence portion of a dwelling occupied by not more than two families, or in the residence portions of either a tenement house or a business building.

(c) No refrigerating system shall be installed, serviced, repaired or dismantled by other than the person, partnership or corporation who has obtained a license from the Board of Examiners in accordance with the rules and regulations of the Board of Buildings, except as provided in Section 217 (c) and (d). The license shall continue in force for one year unless revoked or suspended for cause by the Board of Buildings. The license shall pay an annual fee of $100.

(d) No permit shall be issued until a licensed installer has filed notice with the Fire Commissioner that the installation of the system has been made in accordance with the requirements of this code.

(e) No refrigerating system shall be maintained or operated employing a refrigerant other than those specified in this article without a permit issued upon such conditions as are deemed necessary by the Fire Commissioner in the interest of public safety.

Sec. 217. Supervision:

(a) No refrigerating system containing more than 100 lbs. of refrigerant shall be operated in any building except under the personal supervision of either a duly licensed engineer or a person who has obtained a certificate of qualification to operate such a system from the Board of Examiners in accordance with the rules and regulations of the Board of Buildings. If the refrigerating system contains more than 100 lbs., but not more than 200 lbs. of refrigerant and is fully automatic, the occasional inspection of a licensed engineer or a person having a certificate of qualification shall be required in each 24-hour period. Such engineer or person having certificate or qualification shall not supervise or operate refrigerating equipment in more than one building except in buildings comprising an interconnected group located in the same city block.

(b) Licenses for engineers and certificates of qualification shall be issued only after an examination conducted by the Board of Examiners of the Board of Buildings. Upon receipt of such certificate, the applicant, therefore shall pay an annual license fee as follows: For the initial fee, $10, and for a renewal thereof the sum of $2 if such renewal be applied for within 30 days prior to the expiration of such certificate. Any such certificate may be revoked or suspended for cause at any time by the Board of Buildings.

(c) A licensed engineer or a person holding a certificate of qualification to operate a refrigerating system may make emergency repairs to any refrigerating system which has been installed and operated and is under his supervision and for which his certificate has been issued.

(d) Unit system refrigerators and unit system air conditioners may be moved from one location to another in the same building by persons other than licensed installers, but shall only be originally installed, serviced and/or repaired and/or dismantled by a licensed installer.

Sec. 218. Classifications:

(a) For the purpose of this article, refrigerants shall be classified as non-irritant or irritant, and further as flammable or non-flammable.

Sec. 219. Permissible Locations:

1. Public Buildings

(a) No refrigerating system shall be installed in or on the stairways, halls, lobbies, entrances, exits, or auditoriums of any public building.

(b) No piping for the purpose of containing refrigerant shall be installed throughout any public building, or from one room to another in such building.

(c) No refrigerating system employing an irritant and/or flammable refrigerant shall be installed and operated in any public building except as specified in paragraphs (d), (e), and (f).

(d) Unit system refrigerator of the sealed type containing not more than 6 lbs. of an irritant and/or flammable refrigerant, for which sealed unit system a certificate of approval has been issued by the Fire Commissioner, may be installed and operated in schools, lodge rooms, dance halls, bath houses, armories, fire houses, passenger depots, and diet kitchens of hospitals. Such unit system refrigerator shall not be used for air conditioning and shall not be installed and operated in subways and the rooms in which persons are confined or helpless in hospitals, asylums, or jails.

(e) Systems employing an irritant and/or flammable refrigerant used exclusively for mechanical instruction or research purposes may be used in a school or college.

(f) No refrigerating system containing an irritant and/or flammable refrigerant except a unit system refrigerator of the sealed type, and for which a certificate of approval has been issued by the Fire Commissioner, shall be located in an exhibition hall such as the Grand Central Palace, Madison Square Garden, or an armory.

(g) No refrigerating system containing more than 20 lbs. of a non-irritant and non-flammable refrigerant, shall be used in a room in a public building other than a vapor-proof machinery room used for no other purpose and in which no open flame is present or apparatus to produce an open flame is installed.

(h) When a refrigerant marked with an asterisk (*) in Table 1 is used in any room in a public building or a subway or in a room opening directly therein, in which there is an apparatus for producing an open flame, then such apparatus shall be provided with a hood capable of removing the products of combustion to the open air. If such hood is not provided the refrigerant shall be classified as irritant for such room, and shall be subject to all the rules covering irritant refrigerants in this sub-division. Flames made by matches, cigarette lighters, small alcohol lamps, and similar devices shall not be considered open flames.

(i) No refrigerating system employing an irritant and/or flammable refrigerant shall be used in a railroad passenger depot or subway or in a room opening directly therein.

(j) Not more than 20 lbs. of a non-irritant and non-flammable refrigerant shall be used in any one refrigerating system by the direct method of refrigeration for air conditioning in a public building.

(k) No ducts shall be installed in a public building from one room to another for the purpose of carrying air from a refrigerating system employing the direct method of refrigeration.

(l) Brine or water cooled by an irritant and/or flammable refrigerant may be obtained from a system external to a public building for air conditioning such building provided the double indirect open spray method of refrigeration and/or the double indirect closed surface method of refrigeration is used for cooling brine or water in a space external to and completely cut off from such building.

2. Residence Buildings

(a) No refrigerating system shall be installed in or on the stairways, halls, lobbies, entrances, or auditoriums of any residence buildings.

(b) No refrigerating piping shall be carried throughout any residence building except as provided in paragraph (c).

(c) No refrigerating system shall be installed from one story to another in a residence building except from the roof machinery space to a roof penthouse and/or the story immediately below the roof and in the business section of the building from the basement or sub-basements to the first story and/or first story mezzanine, when confined to the space occupied by a single tenant.

(d) A refrigerating system shall be confined to the space occupied by a single tenant on any one floor in a residence building except as provided in paragraph (c).

(e) No refrigerating system employing the direct method of refrigeration in a two-family dwelling shall be installed for the common use of both families.

(f) No refrigerating system employing an irritant and/or flammable refrigerant shall be used for air conditioning in a residence building, except by the double indirect open spray method of refrigeration and/or the double indirect closed surface method of refrigeration.

(g) No refrigerating system using the direct method of refrigeration employing more than 500 lbs. of refrigerant in any one system shall be installed for air conditioning in a residence building.

(h) No refrigerating system using the direct method of refrigeration employing more than 50 lbs. of refrigerant in any one system shall be installed for air conditioning a sleeping room or rooms in a residence building.

(i) Brine or water cooled by an irritant and/or flammable refrigerant may be obtained from a system external to a residence building for air conditioning such building provided the double indirect spray method of refrigeration and/or the double indirect closed surface method of refrigeration is used.

3. Business Buildings

(a) No refrigerating system shall be installed in or on the stairways, halls, lobbies, entrances, or auditoriums of any business building.

(b) No refrigerant piping shall be carried throughout any business building except as hereinafter permitted in this sub-division.

(c) No refrigerating system shall be installed from one story to another in a business building except from the roof machinery space to a roof penthouse and/or the story immediately below the roof and from the basement or sub-basements to the first story and/or first story mezzanine, when confined to the space occupied by a single tenant.

(d) A refrigerating system shall be confined to the space occupied by a single tenant on any one floor in a business building except as provided in paragraphs (c) and (e).

(e) No refrigerant piping shall be installed throughout any business building or from one building to another except in buildings used exclusively by a single tenant for ice making, cold storage warehouse, meat packing, slaughter house, ice cream manufacture, candy manufacture, dairy, chemical plant, brewery, bakery, solid carbon dioxide manufacture, and/or fur storage, when not more than 100 persons are employed above the first floor. If more than 100 persons are employed above the first floor in such occupancies, then the provisions of paragraph (c) shall apply, unless that portion of the building containing more than 100 persons above the first floor, together with its entrances and exits, be cut off from the rest of the building by unpierced construction.

(f) No refrigerating system or systems for sale or demonstration purposes may be installed and/or stored and/or operated in a department store except that unit systems employing not more than 20 lbs. of refrigerant may be installed and/or operated in a room or rooms cut off from the rest of the buildings by tight partitions and tight revolving vestibule door or doors.

(g) No refrigerating system employing an irritant and/or flammable refrigerant shall be installed and/or operated in a department store except as specified in paragraph (f).

(h) No refrigerating system containing more than 20 lbs. of a non-irritant and non-inflammable refrigerant, shall be used in a department store other than in a vapor-proof machinery room used for no other purpose and in which no open flame is present or apparatus to produce an open flame is installed.

(i) When a refrigerant marked with an asterisk (*) in Table I is used in a room in a department store, in which there is an apparatus for producing an open flame, then such apparatus shall be provided with a hood capable of removing the products of combustion to the open air. If such hood is not provided the refrigerant shall be classified as irritant for such location, and shall be subject to all the rules covering irritant refrigerants in this subdivision. Flames made by matches, cigarette lighters, small alcohol lamps, and similar devices shall not be considered as open flames.

(j) Not more than 20 lbs. of a non-irritant and non-flammable refrigerant shall be used in any one refrigerating system by the direct method of refrigeration for air conditioning in a department store.

(k) No ducts shall be installed in a department store from one floor to another for the purpose of carrying air from a refrigerating system employing the direct method of refrigeration.

(l) No refrigerating system employing an irritant and/or flammable refrigerant using the direct method and/or the indirect open spray method of refrigeration for air conditioning shall be used in a business building, except in buildings used exclusively for ice making, cold storage warehouse, meat packing, slaughter house, ice cream manufacture, candy manufacture, dairy, chemical plant, brewery, bakery, solid carbon dioxide manufacture, and/or fur storage, when not more than 100 persons are employed above the first floor.

(m) No refrigerating system using the direct method of refrigeration, employing more than 500 lbs. of refrigerant in any one system, shall be installed for air conditioning in a business building except in buildings used exclusively for ice making, cold storage warehouse, meat packing, slaughter house, ice cream manufacture, candy manufacture, dairy, chemical plant, brewery, bakery, solid carbon dioxide manufacture, and/or fur storage, when not more than 100 persons are employed above the first floor.

(n) Brine or water cooled by an irritant and/or flammable refrigerant may be obtained from a system external to a business building for air conditioning such building provided the indirect closed surface and/or the double indirect open spray method of refrigeration is used.

4. General Requirements

(a) No brine shall be used in any brine circulating system that will generate inflammable vapor at a temperature below 100° F. when tested in a Tagliabue open cup tester and no irritant and/or flammable refrigerant shall be used as a brine.

(b) No refrigerating system employing more than 2 lbs. of a hydrocarbon refrigerant shall be installed and/or operated in any building.

Sec. 220. Refrigerating Machinery Rooms:

(a) Each refrigerating machinery room in which an irritant refrigerant is employed must be provided with tight fitting self-closing door or doors and have no partitions or openings that will permit the passage of the refrigerant to other parts of the building.

(b) Air washers, blowers, ducts, etc., used for air conditioning shall be partitioned off from the refrigerating machinery room or made air-tight to prevent escaped refrigerant in the machinery room from entering the air-conditioning system.

Sec. 221. Ventilation:

(a) Each refrigerating machinery room shall be provided with means for ventilation to the outer air. The ventilation shall consist of a window or windows opening directly to the outer air, or mechanical means capable of exhausting the foul air from the room to the outer air.

(b) When a window or windows are used the total area provided shall not

(Continued on Page 13, Column 1)

Table 1

Refrigerant	Chemical Symbol	Classified as
Ammonia	NH_3	Irritant and flammable
Butane	C_4H_{10}	Non-irritant and flammable
Carbon Dioxide	CO_2	Non-irritant and non-flammable
Dichlorodifluoromethane (Freon) (F-12)	CCl_2F_2	Non-irritant and non-flammable*
Dichlorotetrafluoroethane (F-114)	$C_2Cl_2F_4$	Non-irritant and non-flammable*
Dichloromethane (Methylene Chloride) (Carrene No. 1)	CH_2Cl_2	Non-irritant and non-flammable*
Dichloromonofluoromethane (F-21)	$CHCl_2F$	Non-irritant and non-flammable*
Dichloroethylene	$C_2H_2Cl_2$	Irritant and flammable
Ethane	C_2H_6	Non-irritant and flammable
Ethyl Chloride	C_2H_5Cl	Non-irritant and flammable
Isobutane	$(CH_3)_3CH$	Non-irritant and flammable
Isopropyl Chloride	$(CH_3)_2CHCl$	Irritant and flammable
Methyl Chloride	CH_3Cl	Irritant and flammable
Methyl Formate	CH_3COOH	Irritant and flammable
Propane	C_3H_8	Non-irritant and flammable
Sulphur Dioxide	SO_2	Irritant and non-flammable
Trichloromonofluoromethane (F-11) (Carrene No. 2)	CCl_3F	Non-irritant and non-flammable*
Trichlorotrifluoroethane (F-113) (Carrene No. 3)	$C_2Cl_3F_3$	Non-irritant and non-flammable*

*Note: See Section 219 1(h) and Section 219 3(i).

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(*Continued from Page 12, Column 5*)

be less than that specified in Table 2.

(c) When mechanical means are used they shall consist of a power driven exhaust fan of the enclosed case blower type which shall be capable of removing from the refrigerating machinery room the amount of air specified in Table 2. The inlet to the fan shall be located near the refrigerating equipment. The outlet from the fan shall terminate outside the building. When airflues are used on either the inlet or discharge side of the fan they shall each have an area not less than that specified in Table 2. Sharp bends in the run of the flues shall be avoided. Systems containing more than 100 lbs. of refrigerant shall have the control for such mechanical means of ventilation located outside of the refrigerating machinery room.

Table 2

Pounds of refrigerant in system	Mechanical cu. ft. per minute discharge	Mechanical sq. ft. flue area	Window or Door Area in sq. ft. for one side only
up to 20	150	¼	4
50	250	⅓	6
100	400	½	10
150	550	⅔	12½
200	680	⅞	14
250	800	1	15
300	900	1	17
400	1,100	1¼	20
500	1,275	1¼	22
600	1,450	1½	24
700	1,630	1½	26
800	1,800	2	28
900	1,950	2	30
1,000	2,050	2	31
1,250	2,250	2¼	33
1,500	2,500	2¼	37
1,750	2,700	2¼	38
2,000	2,900	2¼	40
2,500	3,300	2½	43
3,000	3,700	3	48
4,000	4,600	3¾	55
5,000	5,500	4½	62
6,000	6,300	5	68
7,000	7,200	5½	74
8,000	8,000	5¾	80
9,000	8,700	6¼	85
10,000	9,500	6½	90
12,000	10,900	7	100
14,000	12,200	7½	109
16,000	13,300	7¾	118
18,000	14,300	8	125
20,000	15,200	8¼	130
25,000	17,000	8¾	140
30,000	18,200	9	145
35,000	19,400	9¼	150
40,000	20,500	9½	155
45,000	21,500	9¾	160

Sec. 222. Open Flames and Electrical Equipment:

1. Open Flames

No open flame or any device to produce a flame will be permitted in a refrigerating machinery room in which more than 20 pounds of a flammable refrigerant is employed.

2. Electrical Equipment

(a) Systems containing more than 100 lbs. of an irritant and/or flammable refrigerant shall be equipped with an auxiliary emergency remote control switch which shall be located immediately outside the machinery room to stop the action of the pressure imposing element.

(b) Each electrically operated system containing over 20 lbs. of refrigerant shall be protected by a pressure limiting device located on the high pressure side of the system, set to stop the pressure imposing element at a pressure lower than the value in Table 3, column marked "High Pressure Side," for the refrigerant employed.

(c) Each electrically operated system containing 20 lbs. or less of a refrigerant shall be provided with either a pressure limiting device or an overload relay or link fuse protection, except when the compartment housing the refrigerating equipment is constructed entirely of fireproof materials as classified by the Building Code, or as may be approved by the Fire Commissioner.

Sec. 223. Testing:

(a) Every part of any refrigerating system, except pressure gauges and control mechanisms, erected and/or charged with a refrigerant on the premise where such system is to be used shall be tested and proved to be tight before being operated. The high pressure side of such refrigerating system shall be tested with a pressure not less than 80 per cent of the value shown in Table No. 3, column marked "High Pressure Side," for the particular refrigerant employed in such system. The low pressure side of such refrigerating system shall be tested with a pressure not less than 80 per cent of the value shown in Table 3, column marked "Low Pressure Side," for the particular refrigerant employed in such system. A dated declaration of such test signed by the licensed installer shall be mounted in a frame protected by glass and posted in the machinery room.

(b) No oxygen, mixture of oxygen with any other gas, or any other highly combustible gas shall be used for testing.

Sec. 224. Piping, Tubing, Fittings, Supports, Charging, Air Ducts:

(a) No soldered joints shall be permitted in refrigerant discharge, liquid, or suction mains of more than 2⅛ in. outside diameter erected on the premise. No flared joints shall be permitted in such mains of more than ¾ in. outside diameter. Where solder is employed in making such joints it shall have a melting point of not less than 400° F.

(b) The material used in piping or tubing and fittings shall be unaffected by the refrigerant used. Piping or tubing shall be of a thickness adequate for the pressure of the refrigerant used as stated in Sec. 225, Table 3, after joints are made. All fittings shall be of the full body type, properly reinforced at the joints, and no saddle fittings for attachment to pipe lines shall be permitted. Fittings may be forged or cast non-porous materials. All soldered joints shall be protected against vibration strains.

(c) All piping, tubing, or vessels containing the refrigerant shall be adequately supported in a workmanlike manner by metal hangers or other fireproof material.

(d) Piping or tubing containing a refrigerant shall not be placed in a hall, lobby, stairway, elevator or dumbwaiter shaft, except piping or tubing may pass across a hallway if there be no joints in the section in the hallway and it be contained in a rigid conduit.

(e) Every system which may be charged after installation shall have the charging connection located on its low pressure side. No container shall be left connected to a system except while charging or withdrawing refrigerant.

(f) Liquid level gauge glasses, except those of the bull's eye type, shall have automatic closing shut-off valves and such glasses shall be adequately protected against injury by slotted metal casings.

(g) Intake of outside air shall be from outside the building not less than 6 ft. above the grade and shall be protected by suitable metal screens and substantial automatic shutters or doors, except in a one family dwelling.

(h) In recirculating systems no air shall be recirculated from any space in which operations are carried on that produce or result in objectionable quantities of vapors, flyings, or dust.

(i) Air filters of combustible fibrous materials will not be permitted.

(j) When oil is used in air filters for the purpose of eliminating impurities, it shall have a minimum flash point of 300° F. Such oil filter shall be used on return air only.

(k) When such filters are of the immersion type where the oil tank into which the screens are lowered constitutes a part of the apparatus, the tank shall be of substantial metal construction, properly supported, and shall be equipped with tight fitting covers. Covers must be kept on when tank is not in use. Tank shall be provided with suitable drains to discharge the contents of the oil into a closed tank of substantial construction vented to the outside of the building.

(l) When the screens are removed for cleaning, the cleaning shall be done either in a separate room constructed of approved fire-resistive materials or outside of the building.

(m) Any combustible material of the building within 6 in. of metal ducts shall be protected by non-combustible material.

(n) Ducts shall be made of non-combustible materials. No combustible linings shall be used. Where ducts pass through combustible floors that portion of the duct shall be incased in approved fire resistive materials.

(o) When ducts pass through floors, substantial and reliable automatic dampers shall be provided at outlet and inlet openings and at branch duct connections to such ducts. Bearings of such dampers shall be of non-corrodible material.

(p) When ducts or the outlets from or inlets to same pass through fire walls they shall be provided with approved automatic fire doors or shutters on both sides of the wall through which they pass.

(q) Joints between ducts and floors, walls or partitions, shall be made tight by means of non-combustible material.

Sec. 225. Safety Devices.

(a) All shell type apparatus of more than 6 in. in diameter, containing refrigerant in the liquid phase, shall be protected from over pressure by a spring loaded pressure relief valve. This requirement shall not apply to flooded evaporators located in a refrigerator box and/or to a refrigerating system of the sealed type when such system is part of a unit system refrigerator. A fusible plug will not be accepted in lieu of a spring loaded pressure relief valve where such valves are required.

(b) A rupture member not less than ¼ in. in diameter may be substituted for the pressure relief valve in a carbon dioxide system or a system normally operating below atmospheric pressure.

(c) No shut-off valve shall be located between a pressure relief valve and that part of the system protected thereby, unless two pressure relief valves of the required size are used and so arranged that only one pressure relief valve can be cut off for repair purposes at any one time.

(d) The discharge from pressure relief valves, when an irritant and/or flammable refrigerant is used, must be piped to the outside of the building with the outlet orifice turned downward. The discharge from more than one relief valve may be run into a common header, the area of which shall be not less than the combined area of the pipes connected thereto.

(e) The size of pressure relief valves shall not be less than as follows:

1 in. for a system containing over 1,000 lbs.

½ in. for a system containing 100-1,000 lbs.

¼ in. for a system containing 20-100 lbs.

¼ in. for a system containing 6-20 lbs.

¼ in. for a system containing less than 6 lbs.

(f) Pressure relief valves shall be placed above the liquid refrigerant level and set to relieve at not more than the values in pounds per square inch as set forth in Table 3 for the high and low pressure sides respectively.

Sec. 226. Operating Precautions:

1. Masks and Helmets

(a) A mask or helmet shall be required where amounts of an irritant refrigerant between 100 and 1,000 lbs., inclusive, is employed. If more than 1,000 lbs. of an irritant refrigerant is employed at least two masks or helmets shall be required.

(b) Only complete helmets or masks marked as approved by the United States Bureau of Mines and suitable for the refrigerant employed shall be used and shall be kept in a suitable cabinet immediately outside the machinery room or other approved accessible location.

(c) Canisters or cartridges shall be renewed immediately after having been used or the seal broken and if unused must be renewed at least once every two years. The date of filling shall be marked thereon.

2. Signs

(a) Each refrigerating system shall be provided with an easily legible metal sign permanently attached and easily accessible, indicating thereon the kind and total number of pounds of refrigerant contained in the system.

(b) Systems containing more than 100 lbs. of refrigerant shall be provided with metal signs having letters of not less than ½ in. in height designating the main shut-off valves to each vessel, main steam or electrical control, remote control switch, pressure limiting device, and on all exposed high pressure and low pressure piping in each room where installed outside machinery room.

(c) Each pressure relief valve shall be sealed and labeled by an easily legible metal tag designating its setting in pounds per square inch.

3. Storage of Refrigerant

(a) Not more than 200 lbs. of refrigerant in containers as prescribed by the Interstate Commerce Commission for the transportation of the refrigerant shall be stored in a machinery room.

(b) No refrigerant shall be stored in a machinery room in which less than 20 lbs. is used in the system.

(c) Irritant and/or flammable refrigerants in excess of that permitted in the machinery room shall be stored in a fireproof shed or room used for no other purpose.

(d) Refrigerants shall only be withdrawn from refrigerating systems by a licensed installer.

(e) Refrigerants withdrawn from systems shall be transferred to containers as prescribed by the regulations of the Interstate Commerce Commission for the transportation of such refrigerant. No refrigerant shall be discharged to a sewer or to the open air except through pressure relief valves.

(f) All refrigerants withdrawn from refrigerating systems must be carefully weighed into the containers and the containers must not be filled in excess of the permissible filling weight for such container and such refrigerant as prescribed by the Bureau of Explosives of the Interstate Commerce Commission in Pamphlet No. 9 with all supplements and any re-issue of these regulations.

NOTE: None of the provisions of Article 18, Chapter 10, Code of Ordinances of the City of New York, as amended, is retroactive on installations made prior to date of adoption and for which a permit has been issued.

Miscellaneous

Sec. 300. Violations:

Any person who shall wilfully violate or neglect or refuse to comply with any provisions of this chapter, in addition to any other penalties prescribed by law or ordinance, shall, upon conviction, be punished by a fine of not more than $500 or by imprisonment not exceeding six months, or by both such fine and imprisonment.

Table 3

Refrigerant	Value in Pounds Per Square Inch High Pressure Side	Low Pressure Side
Ammonia	300	150
Butane	100	30
Carbon Dioxide	1,500	1,000
Dichlorodifluoromethane (Freon) (F-12)	225	125
Dichlorotetrafluoroethane (F-114)	75	30
Dichloromethane (Methylene Chloride) (Carrene No. 1)	20	15
Dichloromonofluoromethane (F-21)	75	25
Dichloroethylene	15	15
Ethane	1,100	600
Ethyl Chloride	75	25
Isobutane	135	60
Isopropyl Chloride	35	15
Methyl Chloride	200	100
Methyl Formate	30	15
Propane	250	150
Sulphur Dioxide	175	100
Trichloromonofluoromethane (F-11) (Carrene No. 2)	35	15
Trichlorotrifluoroethane (F-113) (Carrene No. 3)	15	15

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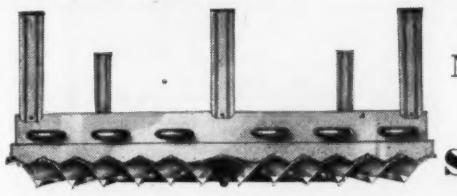
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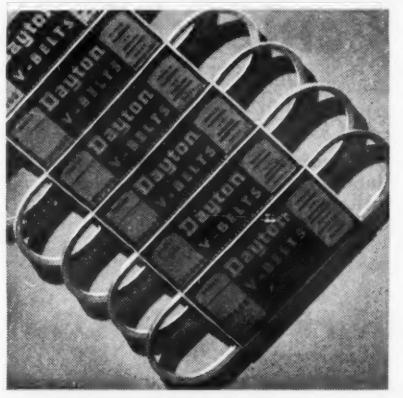
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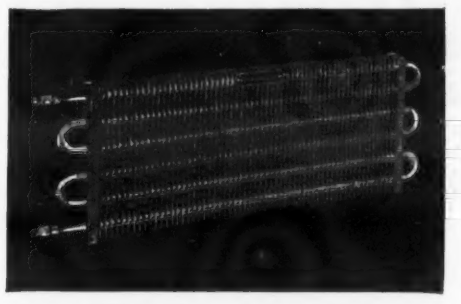
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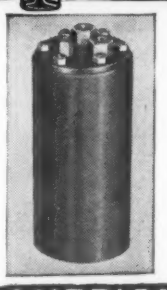
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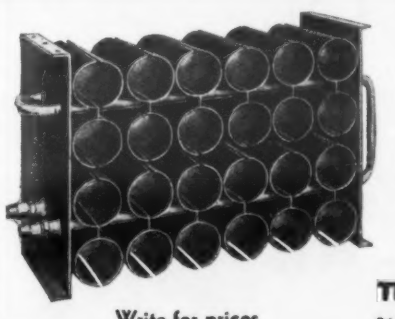
Write for bulletin on complete line covering refrigerating appliances, liquid line filters, dehydrators, acid neutralizers, standard parts and materials, service tools, shaft seals, bearing metals and parts. Descriptive literature will be gladly furnished on any or all of these lines on request.
AMERICAN INJECTOR COMPANY 1481-14th. Street, Detroit, Mich.


KRAMER
BOTTLED BEER-COOLING COILS
fill a need, and bring business. All copper and brass construction. Made in different sizes for different capacities.
Write for prices and information
TRENTON AUTO RADIATOR WORKS
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CONDENSING UNITS AND COMPRESSORS FOR HOUSEHOLD REFRIGERATION BY
JOMOCO, INC.
A SUBSIDIARY OF THE JOHNSON MOTOR CO.
Waukegan, Ill.
CABLE ADDRESS: JOMOCO-WAUKEGAN

BUYER'S GUIDE

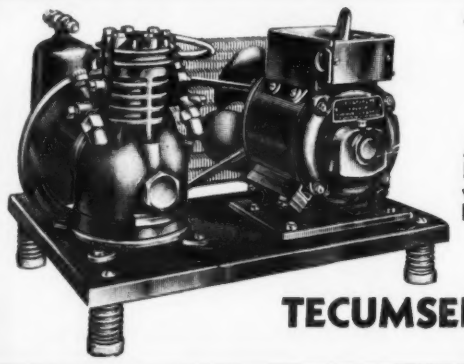
MANUFACTURERS SPECIALIZING IN SERVICE TO THE REFRIGERATION INDUSTRY

HARDY
"Mayflower" Compressors

exclusively manufactured for Commercial use, are the units which have long met with general approval.

For dependability and genuine satisfaction, dealers are recommending this equipment.

HARDY MANUFACTURING CO., Inc., 100 Davis Ave., Dayton, Ohio



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QUALITY-BUILT COMPRESSORS and CONDENSING UNITS

All bearings diamond bored. Positive lubrication of piston by newly developed process plus forced feed lubrication in all models.

Sizes: 1/6, 1/5, 1/4, 1/3 h.p.

Write for prices

TECUMSEH PRODUCTS CO.
Tecumseh, Mich.

KOCH COMMERCIAL REFRIGERATOR CABINETS

All types and sizes of heavily insulated refrigerators and display cases.

WANTED— DISTRIBUTORS and SALES AGENTS

Attractive sales proposition. Some good territories available. Many exclusive features. Write for information, and submit your qualifications.

KOCH REFRIGERATORS, North Kansas City, Mo.

TYLER'S NEW WELDED STEEL REFRIGERATOR CASES

At last a general purpose case at a sensible price. Offers every advantage of the most costly cases at tremendous savings. Modern in every detail. Comes equipped with coils. Single and double duty models.

AN AMAZING VALUE

Hundreds in use. Every store and market a prospect. Home Equipment Company, Fort Wayne, Ind., sold nine cases in two weeks. Write or wire for all the facts.

TYLER *Sales Fixture* CO., Dept. E, Niles, Michigan

3 INCH INSULATION-TRIPLE GLASS

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MASTER

ELECTRIC REFRIGERATION

SERVICE MANUAL

Containing only the first six chapters of the complete book to be published Jan. 1, 1936

BUSINESS NEWS PUBLISHING CO.
Publishers of
ELECTRIC REFRIGERATION NEWS

No need to wait longer—you can begin with the first six chapters immediately.

(See complete rates on page 15 of this issue)

Thermostatic Valves Introduced by A-P

(Concluded from Page 1, Column 2)

stainless steel seat. All working parts are easily removed by loosening the large hexagonal nut at the lower end of the valve. A Monel metal strainer, incorporated into the intake side of the valve, prevents scale or sediment getting under the needle.

Adjustment is made by removing the acorn sealing nut at the bottom of the valve, giving access to the adjusting stem, which is screwed in to increase the superheat, screwed out to decrease it. Superheat is adjustable over the entire range required for commercial and air-conditioning applications.

List price of the valve, with either .062 or .110-in. orifice size, is $12.50.

Model 215 valve has a capacity up to 5 tons, and may be used for the larger commercial installations as well as small air-conditioning applications. It is available for Freon, methyl chloride, or sulphur dioxide systems. List price of this valve, alone, with .222-in. orifice size, is $21.50; with equalizer tube and connection, $24.50.

Model 220, a valve of 5 to 15-ton Freon capacity, is adaptable for use on air conditioning and large commercial installations, and is available for Freon and methyl chloride. List price of the valve alone, with .285-in. orifice size, is $38; with .430-in. orifice, $42; with equalizer connection and tube, the .285-in. orifice size lists at $41; and the .430-in. size at $45.

New A-P Valve

Cross-section of model 215 in Automatic Products new line of thermostatic expansion valves.

Crosley Icy-Ball Units Sold to Indians

SALT LAKE CITY—Western Supply Co., Crosley distributor here, reports a large sales volume on Icy-ball refrigerators which Indians on the Uintah Indian reservation have purchased. Laris Bros. Co. of Roosevelt, Utah, have placed many of the units.

PATENTS

Issued Oct. 29, 1935

2,018,747. REFRIGERATING APPARATUS. Elmer O. Stout, Dayton, Ohio, assignor, by mesne assignments, to General Motors Corp., a corporation of Delaware. Application Nov. 19, 1931. Serial No. 576,033. Renewed May 6, 1933. 20 Claims. (Cl. 62—126.)

2,018,780. AIR CONDITIONING SYSTEM WITH DEHUMIDIFIER AND REHEATER. Robert H. Folsom, Glendale, Calif., assignor to Young Radiator Co., Racine, Wis., a corporation of Wisconsin. Application June 30, 1933. Serial No. 678,442. 8 Claims. (Cl. 257—9.)

2,018,804. ARRANGEMENT FOR COOLING AIR. Jesse E. Rasmusen, Fort Worth, Tex. Application Sept. 4, 1934. Serial No. 742,665. 4 Claims. (Cl. 257—2.)

2,018,896. REFRIGERATION. George C. Pearce, Dayton, Ohio, assignor, by mesne assignments, to General Motors Corp., a corporation of Delaware. Application Oct. 25, 1932. Serial No. 639,461. 2 Claims. (Cl. 62—4.)

2,018,990. HUMIDIFIER. Robert G. Yost and Cyril G. Schelly, Webster Groves, Mo., assignors to Yost-Schelly Patent Estate, Inc., St. Louis, Mo., a corporation of Missouri. Application July 3, 1933. Serial No. 678,814. 4 Claims. (Cl. 261—110.)

2,019,033. HOLDOVER TANK FOR AIR CONDITIONERS. Fred M. Young, Racine, Wis., assignor to Young Radiator Co., Racine, Wis. Application April 8, 1935. Serial No. 15,239. 6 Claims. (Cl. 257—140.)

2,019,091. AIR CONDITIONING SYSTEM. Lawrence A. Philipp, Detroit, Mich., assignor to Kelvinator Corp., Detroit, Mich., a corporation of Michigan. Application Feb. 15, 1934. Serial No. 711,296. 9 Claims. (Cl. 62—6.)

2,019,144. THERMOSTATIC CONTROL MECHANISM. Frederick C. Leonard, Cranston, R. I. Application May 21, 1932. Serial No. 612,759. 9 Claims. (Cl. 236—12.)

2,019,193. BALANCED THROTTLE VALVE. Richard W. Mueller, Pittsburgh, Pa., assignor to Kerotest Mfg. Co., Pittsburgh, Pa., a corporation of Pennsylvania. Application March 7, 1931. Serial No. 520,836. 4 Claims. (Cl. 277—9.)

2,019,194. INSULATION, PARTICULARLY FOR REFRIGERATORS OR THE LIKE. Carl Georg Munters, Stockholm, Sweden. Application Jan. 25, 1934. Serial No. 708,324. In Sweden Feb. 14, 1933. 21 Claims. (Cl. 62—89.)

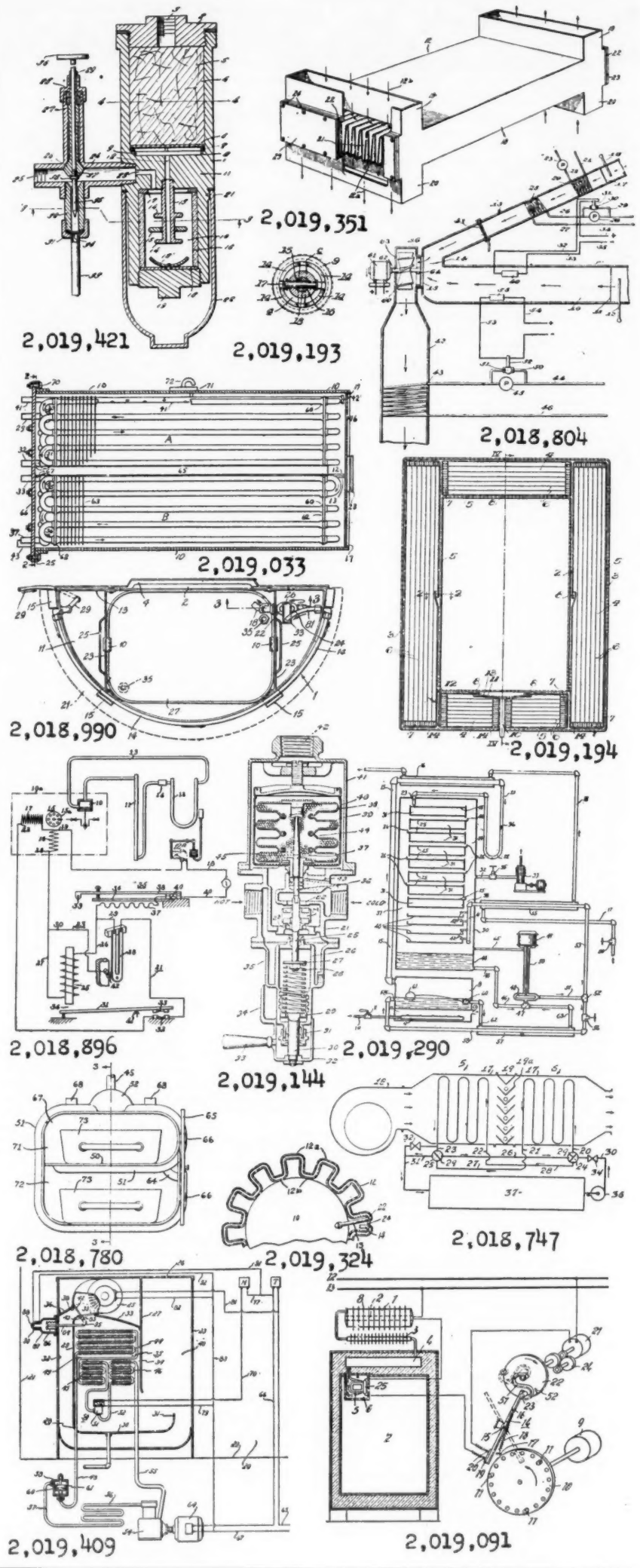
2,019,290. HEATING AND COOLING SYSTEM. Kemper P. Brace, New York, N. Y. Application April 24, 1933. Serial No. 667,606. 7 Claims. (Cl. 257—9.)

2,019,324. REFRIGERATOR CONDENSER. Christian Steenstrup, Schenectady, N. Y., assignor to General Electric Co., a corporation of New York. Application Oct. 11, 1934. Serial No. 747,873. 15 Claims. (Cl. 257—36.)

2,019,351. AIR CONDITIONING APPARATUS. Harold F. Lathrop, Fort Wayne, Ind., assignor to General Electric Co., a corporation of New York. Application Nov. 17, 1934. Serial No. 753,446. 1 Claim. (Cl. 257—245.)

2,019,409. ABSORPTION REFRIGERATING APPARATUS. Kurt Hahnel, Berlin-Siemensstadt, Germany, assignor to Siemens-Schuckertwerke Aktiengesellschaft, Berlin-Siemensstadt, Germany, a corporation of Germany. Application July 9, 1934. Serial No. 734,388. In Germany July 14, 1933. 12 Claims. (Cl. 62—5.)

2,019,421. ATTACHMENT FOR REFRIGERATING SYSTEMS. Edgar T. Link, Allentown, Pa. Application Sept. 13, 1934. Serial No. 743,921. 4 Claims. (Cl. 62—1.)



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☐ Enter my subscription to Electric Refrigeration News for one year (52 issues), and send me all three of the above books—the Directory, the Market Data Book, and the Master Service Manual. Enclosed find remittance.*

☐ Enter my advance order for the Master Service Manual, to be published about Jan. 1, 1936, and send me a free copy of the 112-page booklet containing the first six chapters as published in the weekly issues of Electric Refrigeration News from April 10 to Aug. 21, 1935. Enclosed find remittance.*

*See rates above.

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Attention or In care of .....

Street .....

City ..... State .....

Remarks .....
(Please indicate products sold or principal line of business.) 11-13-35

QUESTIONS

Lessons for Service Men

No. 2559 (Manufacturer, Pennsylvania)—"Could you advise me where I may obtain the syllabus lectures and lessons given service men and the examination paper?

"Perhaps the above are identical with the MASTER SERVICE MANUAL of which we have ordered six copies from you. I should like to have this information as promptly as possible and wish to thank you in advance for your attention."

Answer: The MASTER SERVICE MANUAL, written by K. M. Newcum and appearing in instalment form in the weekly issues of ELECTRIC REFRIGERATION NEWS, was originally started in the form of a series of lessons and the information was used as a text for a school in which service engineers were trained.

It is possible, however, that you may have in mind one of the courses being offered by trade schools on refrigeration servicing.

First 6-Months Sales

No. 2560 (Manufacturer, Illinois)—"What issue of ELECTRIC REFRIGERATION NEWS contains table showing refrigerator distributor sales to dealers for first six months of the year?"

Answer: No summary was published for the first six months of the year.

The following are the dates of issues in which the sales for each of the first six months have been reported:

January	March 13 issue
February	April 10 issue
March	May 15 issue
April	June 5 issue
May	July 17 issue
June	July 31 issue

Figures published in these issues represent sales by manufacturers to distributing outlets.

Majestic Unit Repairs

No. 2561 (Service company, New York)—"We would like to know who would repair hermetically sealed Majestic units in our territory. We do minor repairs ourselves."

Answer: For information on Majestic parts and service, write P. L. Yates, service manager, Grigsby-Grunow Co., 5801 Dickens Ave., Chicago, Ill.

Specifications Data

No. 2562 (Service man, Massachusetts)—"I note, in the Standard Handbook for Electrical Engineers, a bibliographical reference to an issue of your publication relative to a descriptive list of some 90 makes of household refrigerators together with general specifications and characteristics.

"Is it possible to obtain this issue and, if so, what is the charge?

"Do you publish, or can you refer me to a service manual which covers the majority of household refrigerators?"

Answer: ELECTRIC REFRIGERATION NEWS has published general specifications of the yearly models of household electric refrigerators since 1932. Specifications for the year 1932 were published in the May 18, 1932, engineering section of ELECTRIC REFRIGERATION NEWS, and were revised and published in the 1932 REFRIGERATION DIRECTORY. A copy of the May 18, 1932, issue is available upon receipt of 10 cents, and the 1932 DIRECTORY is priced at $1 per copy.

We cannot furnish specifications for 1933 models, which were published in the March 22, 1933, issue of the NEWS, since our supply of this issue has been exhausted.

Our supply of the March 21, 1934, issue of ELECTRIC REFRIGERATION NEWS in which the 1934 specifications were published is also exhausted. However, these specifications were also published in the 1934 REFRIGERATION DIRECTORY AND MARKET DATA BOOK, a copy of which is available upon receipt of $3.

The 1935 household specifications were published in the March 20 and the June 12 issues of ELECTRIC REFRIGERATION NEWS, but we are also completely sold out of these issues.

With reference to a service manual, the MASTER SERVICE MANUAL which we are now compiling will cover broadly the service operations on types and makes of household electric refrigerators now being sold in great quantities by the leading manufacturers.

Detailed instructions regarding the methods of handling each of the problems most commonly encountered in practical experience will be published in this book.

The MANUAL will consist of a compilation of the series of articles by K. M. Newcum published in the weekly issues of ELECTRIC REFRIGERATION NEWS, together with other supplementary material.

Lubricating Oils

No. 2563 (Dealer, Spain)—"The object of this letter is to ask you for information.

"I am in the electric refrigeration business, dealing with refrigerators equipped with methyl chloride and sulphur dioxide. I handle units up to 4 horsepower.

"In those equipped with SO_2 we have met some lubrication difficulties. Here in this country, similar large corporations selling lubricating oils, are accustomed to offer oils which are not always most suitable. As each one offers a type of oil distinct from the other, we don't have much confidence in any of them.

"For this reason, I ask you to have the kindness to indicate to me which is the lubricating oil most suitable for the SO_2 units, pointing out at the same time all the characteristics, composition, etc., so that we will not make a mistake.

"Some claim that a mixture of castor (vegetable) oil is very good. Tell me the lubricant most appropriate for methyl chloride."

Answer: A very comprehensive article covering the use of lubricating oils in refrigerating machines was published in the Oct. 2 issue of ELECTRIC REFRIGERATION NEWS.

Companies in this country which have developed special oils for use with refrigeration machines include:

Matheson Co., East Rutherford, N. J.
Standard Oil Co. of Indiana
910 S. Michigan Ave., Chicago, Ill.
Texas Co., 135 E. 42nd St., New York City

ElectrICE Service Manual

No. 2564 (Service company, Washington)—"Several weeks ago I wrote a letter to the Deissler Machine Co., Greenville, Pa., inquiring about a Belding Hall ElectrICE refrigerator which I purchased second-hand recently.

"They were unable to supply me with a service manual, and wrote the following:

"'Our supply of service manuals on this refrigerator is exhausted. However, ELECTRIC REFRIGERATION NEWS published complete information on the servicing of this refrigerator in the Aug. 22 and 29, 1934, issues, and you can no doubt secure copies of these by writing direct to Business News Publishing Co.'

"Can you supply me with these copies, or any information concerning the servicing, etc., of this particular machine?

"They do not sell them in Seattle, and apparently there is no service company in Seattle on this particular refrigerator.

"If you can furnish me these issues above set forth, please let me know and I will remit whatever charge there is for the same."

Answer: Copies of the Aug. 22 and 29, 1934, issues of ELECTRIC REFRIGERATION NEWS, containing information on the Belding-Hall ElectrICE machine, will be forwarded upon receipt of 20 cents, as back issues are sold at a cost of 10 cents each.

Parts for these refrigerators and further service information may be obtained by writing W. D. Krauter, service manager, Belding-Hall Co., Belding, Mich.

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COMMERCIAL EVAPORATORS
DOMESTIC EVAPORATORS
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POSITIONS AVAILABLE

SALESMEN in the different commercial centers of the country to sell The Reeves Unit Cooler to Refrigeration Dealers. This cooler has been introduced in New England during the past two years with wonderful success. It is designed solely for use in Market and Food refrigerators and is entirely different from any other cooler. Prefer men now calling on refrigeration dealers, and we offer liberal commission. If you reply give complete details and reference. The Reeves Engineering Co., Milford, Conn.

EXCEPTIONAL OPPORTUNITY
A leading refrigerator manufacturer has an opening for a high caliber sales representative with a successful record in working with refrigeration dealers. To be considered, give us a full outline of your experience, with all details we should know, including age, salary requirement, and references. All replies confidential. Box 744, Electric Refrigeration News.

FACTORY REPRESENTATIVE WANTED

EASTERN manufacturer of artificial food for use in domestic refrigerators has exceptional opening for Chicago, Pacific Coast and Canada representative. Must be acquainted with distributors and manufacturers and able to invest $1,000.00 for merchandise. Big field. Proposition should net right man from $5,000.00 to $10,000.00. Write in detail about yourself. Box 741, Electric Refrigeration News.

POSITIONS WANTED

PURCHASING AGENT now with well known manufacturer wants connection with house offering greater opportunities for advancement. Now buying refrigeration, air conditioning, oil burner and general electrical and machinery equipment. Also familiar with printing and advertising materials. Age 31, married, good basic education and training. Nominal salary. Box 740, Electric Refrigeration News.

FRANCHISE WANTED

FORMER REFRIGERATION Executive with many years experience in all branches and departments of refrigeration, in the East, seeks agency or distributorship for manufacturer of refrigeration accessories or allied products, in New York and New Jersey. Please give full particulars. Box 743, Electric Refrigeration News.

NEW YORK CITY Manufacturers' Agent wants to represent in Metropolitan area reputable and responsible manufacturers of commercial refrigerators, refrigeration and kindred accessories. Have successful sales record twelve years' executive experience that invites investigation. Excellent office facilities Grand Central district established. Prefer commission arrangement. Interested only in bona fide proposition. Box 737, Electric Refrigeration News.

EQUIPMENT FOR SALE

FOR IMMEDIATE SALE: Frigidaire condensing units, in perfect condition, ¼ H.P., Model S. complete with two tray float evaporator $14.00, less motor $9.00. Model G twin cylinder complete $20.00, less motor $15.00. Enquiries for other equipment solicited. Elbros Electric Co., Inc., 45 W. 20th St., New York City.

REPAIRS

HALECTRIC thermostat repair service. B & B, G.E., Cutler-Hammer, Penn, Ranco, Tag., etc. Expansion valves repaired. Gas service, Ethyl, Methyl, Iso-Butane, Sulphur. Your cylinder or ours. Competitive prices. Halectric Laboratory, 1793 Lakeview Road, Cleveland, Ohio.

REBUILDING of ice cream cabinet coils, complete dismanteling, all tubes silver-welded, flange flooded in anew, thoroughly cleaned, cadmium plated, equal to new coil. Frigidaire or Kelvinator 20X, $6.00—22X, $7.00—less float. Also Kelvinator Yukon boilers completely rebuilt and plated, $4.00 each. Refrigeration Specialty Co., 725 Atlantic Ave., Brooklyn, N. Y.

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GENERAL ELECTRIC SEALED UNITS—repaired, rebuilt, exchanged. Guaranteed service. Our modern shop is especially equipped to efficiently repair these units. Prices low and workmanship the best. Give model number when writing. Immediate service. Rex Refrigeration Service, 446 East 79th St., Chicago.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. Van Deventer (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

SCHOOLS

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